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UNIVERSITY

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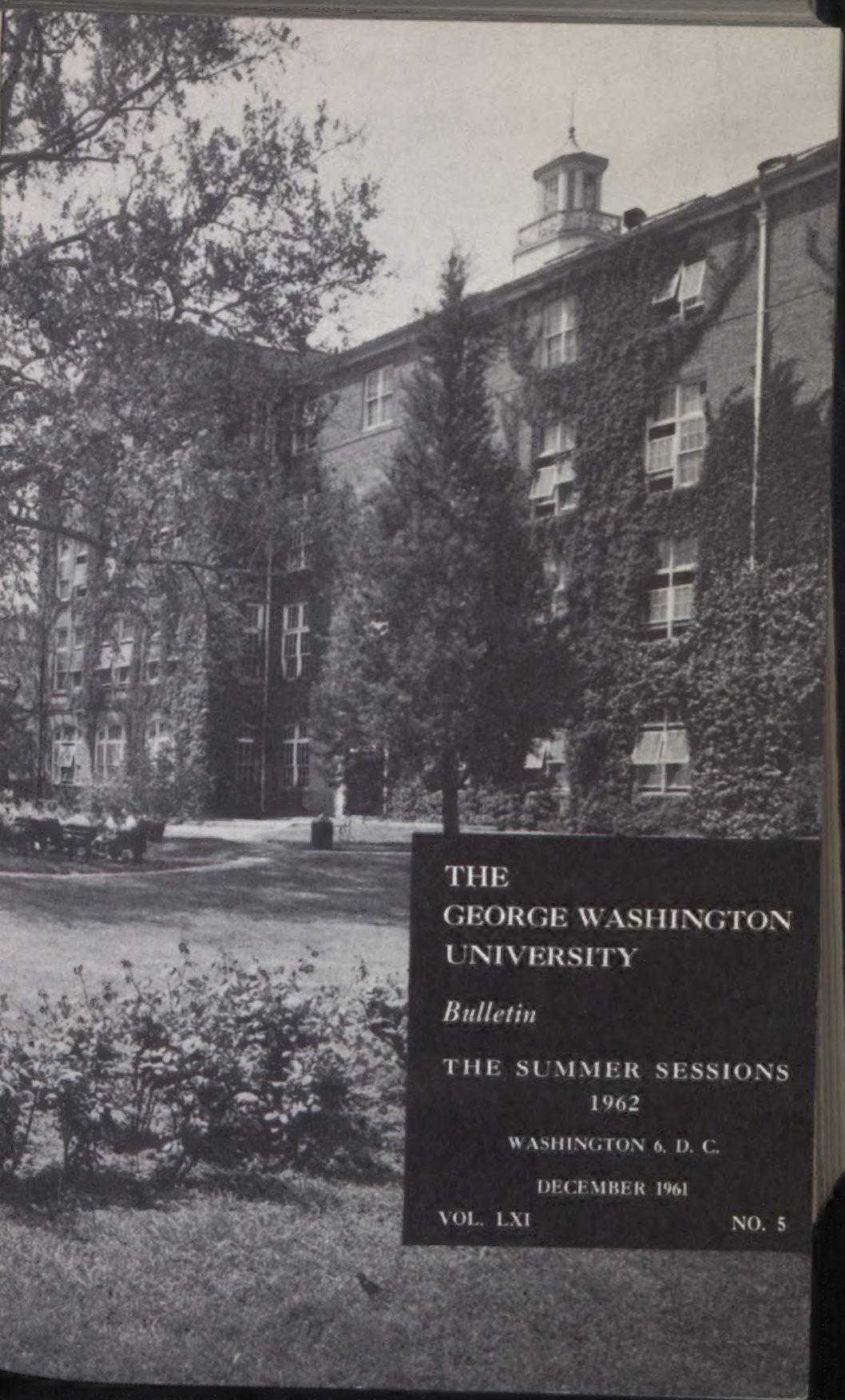
CONTENTS

1. Summer Sessions Bulletin 1962
2. Composite Catalogue 1962-63
3. College of General Studies Bulletin 1962-63
4. School of Government, Business, and International Affairs Bulletin 1962-63
5. School of Education Bulletin 1962-63
6. Division of University Students 1962-63
7. Columbian College of Arts and Sciences Bulletin 1962-63
8. Law School Bulletin 1962-63
9. School of Engineering Bulletin 1962-63
10. School of Medicine Bulletin 1962-63
11. Summaries of Doctoral Dissertations Bulletin 1962

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THE GEORGE WASHINGTON UNIVERSITY

Bulletin

THE SUMMER SESSIONS 1962

WASHINGTON 6, D. C.

DECEMBER 1961

VOL. LXI NO. 5

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

Admission.....Director of Admissions, Building C

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Alumni Association.....Alumni Office, Bacon Hall

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Graduate Study

In Arts and Sciences

Master's degrees.....Dean of Columbian College of Arts and Sciences

Doctor of Philosophy.....Dean of The Graduate Council

In Education.....Dean of The School of Education

In Engineering.....Committee on Graduate Studies, School of Engineering

In Law.....Dean of The Graduate School of Public Law

In Accounting, Business Administration, Business and Economic Statistics, Economic Policy, Hospital Administration, International Affairs, Personnel Administration, Public Administration, Public Affairs.....Dean of The School of Government, Business, and International Affairs

Housing

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Women.....Director of Women's Activities, Woodhull House

Scholarships.....Chairman, Committee on Scholarships, Building T

Student Employment.....Student Placement Office, 2114 G Street NW.

Summer Sessions.....Dean of the Summer Sessions, Building T

Transcripts of Records.....Registrar, Building C

Veterans Education.....Director of Veterans Education, Building Q

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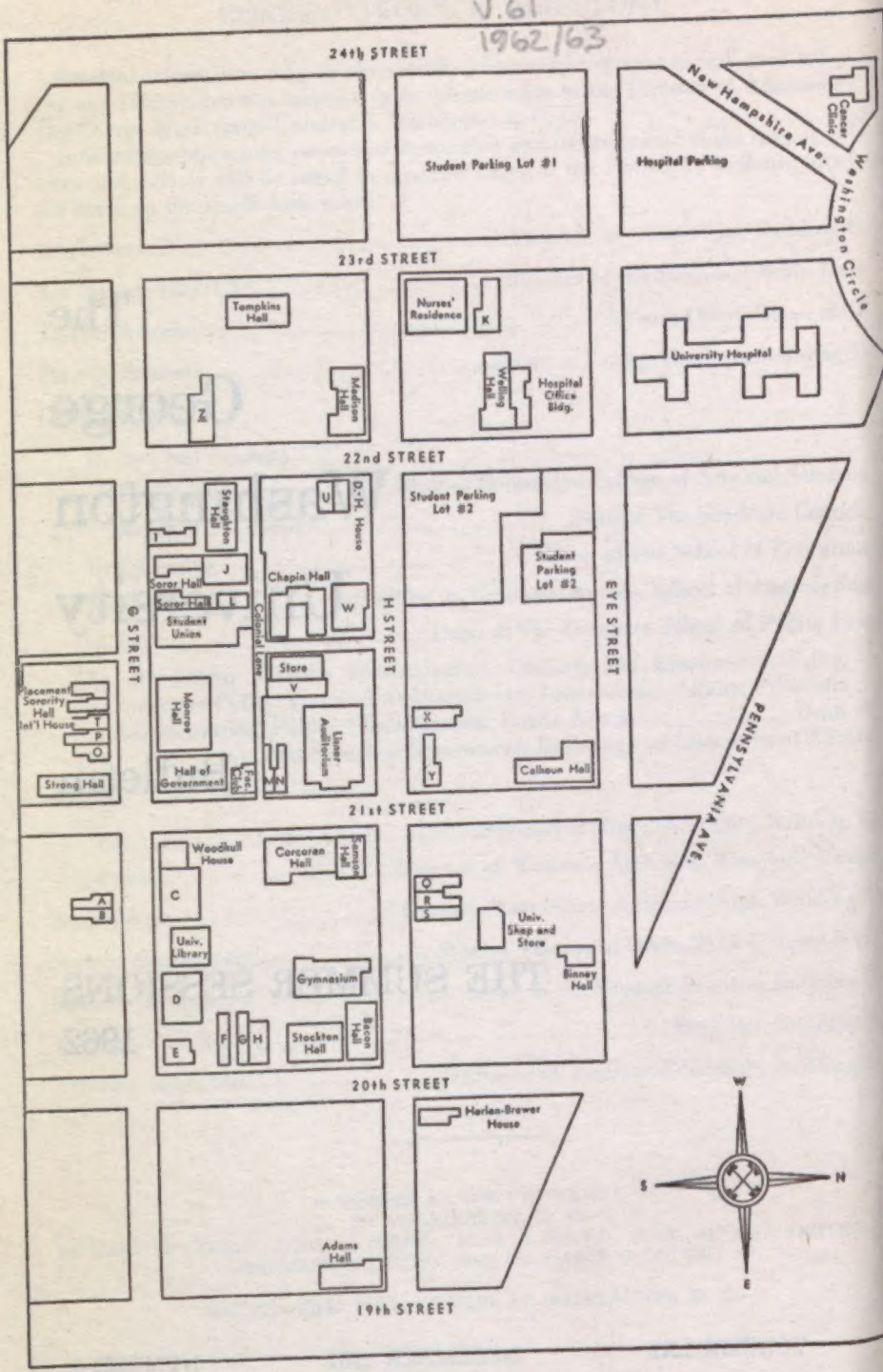
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THE SUMMER SESSIONS 1962

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CONTENTS

Calendar of the Summer Sessions iv

The Board of Trustees 1

Officers of Administration 2

The University: History and Organization, Academic Status, Location, Educational Facilities 4

The Summer Sessions 6

Admission 6

Registration 7

Fees and Financial Regulations 7

University Regulations 9

Veterans Education 10

Student Life 11

The Colleges, Schools, and Divisions 12

Columbian College of Arts and Sciences 12

The Graduate Council 14

The Law School 14

The School of Pharmacy 15

The School of Education 16

The School of Government, Business, and International Affairs 16

The College of General Studies 18

The Division of University Students 18

The Division of Special Students 18

Courses of Instruction 19

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THE UNIVERSITY

History and Organization

The idea of a university in the Capital of the Nation was sponsored by George Washington. During his public life he urged the establishment of such an institution and in his will he left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

Columbian College in the District of Columbia was chartered by an act of Congress of February 9, 1821. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The George Washington University includes 14 colleges, schools, and divisions. Many of these offer programs of study in the Summer Sessions, as described later in this Bulletin.

Academic Status

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. Such accreditation is vital to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy. The School of Engineering is on the accredited list of the Engineers' Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for the Accreditation for Teacher Education.

Location

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor; as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

Educational Facilities

The University Library.—The University Library contains approximately 352,000 volumes and, with the exception of the Law and medical collections, is housed in the Library Building.

Regulations governing the use of the library, the circulation of books, and the use of reserve books and periodicals are available at the service desks of the Library.

Other Library Facilities in Washington.—The student has access also to the Library of Congress, the Public Library of the District of Columbia and its branches, the Library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many other great special collections of the government departments.

Research Facilities of Washington.—The arrangement of the summer schedule of classes permits the full-time student to avail himself of the opportunity to study, at first hand, the working of the Federal Government and so to form a background for intelligent and useful citizenship.

In the departmental libraries of the Federal Government are a multitude of reports made by eminent specialists in all fields of science on the results of study and research in the bureaus, experimental stations, laboratories, museums, and observatories of the Nation.

In addition to the governmental collection the student has available the research facilities of such scientific and educational groups, whose headquarters are situated in Washington, as the Carnegie Institution, the American Council on Education, the National Academy of Sciences, the National Research Council, the National Education Association, and the National Geographic Society.

THE SUMMER SESSIONS

The work of the Summer Sessions has been planned to meet the needs of full- and part-time students.

During the summer of 1962, courses are offered in Columbian College of Arts and Sciences; the Law School; the School of Pharmacy; the School of Education; and the School of Government, Business, and International Affairs.

ADMISSION

APPLICATION FOR ADMISSION OR READMISSION

Application for nonedegree status must be received with necessary credentials no later than the Saturday preceding the day of registration for the session for which admission is sought (see the Calendar, page iv).

Application for degree candidacy together with all required credentials should be received by May 1 for the Summer Sessions to insure consideration. Late applications will be considered only if the application form and all required credentials are received in the Admissions Office no later than two weeks prior to the first day of registration for the Summer Sessions. Exceptions may be made under extraordinary circumstances, at the discretion of the Director of Admissions.

For admission to the Law School see page 15.

Application Forms

Nondegree Candidates.—For the convenience of those not working toward degrees, a modified form for application for admission is enclosed in this catalogue. This form should be completed and mailed to the Office of the Director of Admissions, with the application fee of $5.

Degree Candidates.—Applicants for admission as degree candidates should request the regular Application for Admission form from the Office of the Director of Admissions. This form should be completed and mailed to the Office of the Director of Admissions, with the application fee of $10.

Readmission.—A student previously registered in this University who did not attend during the semester preceding this registration should complete and return an Application for Readmission form, which is available at the Office of Admissions.

The Student Not Seeking a Degree

The student not seeking a degree from this University should apply for admission to the Division of University Students, a nondegree-granting division which makes the work of the University available to the following three types of applicants:

1. The student registered for a degree at another institution is admitted to the extent that facilities permit. No transcript of record is required*.

2. The student over 21 years of age who is not working for a degree in this or another institution may be admitted to take courses for which he has adequate preparation, as determined by the department concerned. No transcript of record is required*.

3. Secondary school applicants under 21 years of age who have not attended s

* No student is eligible for admission if he has been academically suspended within the past calendar year.

college or higher institution may be admitted if they meet the entrance requirements of Columbian College of Arts and Sciences (see pages 13–14).

The Student Seeking a Degree

An applicant from a secondary school must (1) send to his high school principal the high school record form provided by the University, with the request that the completed form be mailed *to the Office of the Director of Admissions;* and (2) request a report of scores on the Scholastic Aptitude Test from the College Entrance Examination Board.

An applicant who has attended one or more institutions of higher learning must request each registrar to mail to the Office of the Director of Admissions a transcript of his record, even though credits were not earned. An honorable dismissal is required from the institution last attended.

The appropriate report of Graduate Record Examination, when available, should accompany application to graduate degree candidacy.

REGISTRATION

A student may not register for classes until the Office of the Director of Admissions has approved his admission to this University.

A student previously registered in this University who did not attend during the semester preceding this registration must file an application for readmission in advance of registration.

Registration for both sessions of the Law School summer term will be held June 11. *Summer students planning to take the New York Bar examination must register at this time for both sessions and complete both.* Students wishing to attend the second session only should register on July 27. Tuition fees are payable by the session.

In special instances, with the permission of the instructor, a person who has been admitted to the University may be registered as an auditor in a class without being required to take active part in the exercises or to pass examinations. No academic credit will be allowed for such attendance.

Changes in Program of Study

Changes in programs of study may be made only with the permission of the adviser or major professor and the dean or director of the college, school, or division concerned.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted:

Tuition Fees

For each semester hour* for which the student registers (except for work taken by a candidate for a Doctor's degree)	$30.00
For the degree of Doctor of Philosophy†, Doctor of Education, or Doctor of Business Administration:	
For work‡ leading to and including the general examination§	1,000.00
For work leading to and including the final examination§	1,000.00
For the degree of Doctor of Juridical Science:	
For work leading to and including the final examination§	1,000.00

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are due with the tuition fee for the course. Breakage of apparatus is charged against

*, †, ‡, § See footnotes on page 8.

the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee, the individual student will be required to pay such additional charges as are determined by the department concerned.

GRADUATION FEES	
Wherein the degree of Associate in Arts or Associate in Science is granted	10.00
Wherein a degree other than the Associate in Arts or Associate in Science degree is granted	25.00
Wherein an Advanced Professional Certificate in Education is granted	25.00
FEE FOR BINDING MASTER'S THESIS	6.00
FEE FOR PRINTING SUMMARY OF DOCTORAL DISSERTATION	85.00
SPECIAL FEES	
Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00
Application for Transfer fee, charged‖ each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Admission tests (when required)	6.00–12.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one course or more than one course	2.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees")	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
For each examination to qualify for advanced standing and for each special examination	5.00
Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor	3.00
Transcript fee, charged for each transcript of record after the first	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of the University library; (4) medical attention and hospital services described below. These privileges, with the exception of the issuance of transcripts, cease when the student withdraws or is dismissed from the University.

Medical and Hospital Services.—These services include: (1) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examinations; (2) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration. All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special

* Payment of tuition for the Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

† The tuition fee is to be paid in full at the time of registration or in two years at the rate of $25 a semester. No residence fee will be charged if a third year is needed for completion of either part of the degree requirements.

‡ This fee does not cover the cost of tuition for undergraduate courses numbered 1 to 100.

§ When a limited schedule is carried which extends the time of completion of the program of study to more than one year, the proportionate part of the charge may be fixed by the Treasurer.

‖ Payable at the time of application for transfer or readmission.

services must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

Hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Payment of Fees

All fees are payable at the Office of the Cashier, 725 Twenty-first Street, NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each session are due in advance at the time of registration.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

Withdrawals and Refunds

Registrations are for the session, and no refunds or rebates are allowed. In no case will tuition be refunded because of nonattendance upon classes.

Payments apply only to the session for which registration charges are incurred, and in no case will these payments be credited to another session or term.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a laboratory check-out fee of $3. A student dropping a course before the end of the session must check out of the laboratory at the next scheduled laboratory period.

No permission to withdraw and no certificate for work done will be given a student who has not a clear financial record.

UNIVERSITY REGULATIONS

Students in the Summer Sessions are subject to, and are expected to familiarize themselves with, the University regulations as stated in the general catalogue.

Academic Credit.—The Summer Sessions are an integral part of the University. Academic credit for completed work will be given toward the appropriate degrees in the various colleges and schools of the University in accordance with their separate regulations and requirements.

Residence.—Summer Sessions work may be counted in residence but the candidate for a degree must satisfy the residence requirements of the school or college concerned as stated in the general catalogue.

Amount of Work.—No full-time student may take more than 9 semester hours of work during the eight-week session; no employed student, more than 6 hours.

In the Law School the maximum amount of work that may be taken in both sessions by a full-time student is 12 semester hours; by an employed student, 8 semester hours.

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" office is maintained in the Student Union.

VETERANS EDUCATION

The Office of Veterans Education, Building Q, 2029 H Street NW., is a service bureau for veterans interested in studying at this University. It acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office about the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D. C.

Public Law 634
(War Orphans Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

Public Law 190
(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

Public Law 550
(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950, and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

Public Laws 16 and 894
(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to Veterans Administration for approval of their training objectives at least sixty days prior to registration.

STUDENT LIFE

Social and Recreational Program of the University

The social and recreational program includes many varied activities and scheduled events. In addition to this campus program a great abundance of cultural as well as social and recreational opportunities are available to persons living in the metropolitan area. During the summer the University posts a weekly guide to all these on a bulletin board in the Student Union.

Living Accommodations

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance. Forms for application, together with detailed information, may be obtained from the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls, except freshmen, under the age of twenty-one who are enrolled for 6 or more credit hours of academic work at the University and who are not living with their parents or relatives, may live outside the residence halls only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to reside outside the residence halls except with persons approved by the Director of Activities for Women.

Freshman girls may reside outside the residence halls *only* with their parents or with immediate relatives with the written approval of their parents.

During the summer of 1962 the following residence halls will be open. Meals are served in the Student Union.

Women Students.—Dolly Madison Hall provides double rooms at $40 a month a person.

Men Students.—John Quincy Adams Hall provides double rooms, with study alcove and bath, at $40 a month a person.

Residence hall payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of $2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of $5.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain

government agencies, participate. This program offers outstanding employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting offices. The services of the Counseling Center are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

Religious Life

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

THE COLLEGES, SCHOOLS, AND DIVISIONS

Information concerning specific requirements for degrees is omitted from this bulletin. For such information, the student is referred to the general catalogue.

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Incoming liberal arts and science freshmen and all transfer students of less than junior class standing are registered in the lower division of Columbian College. The lower division also provides the first two years of the prelegal and premedical programs, the preprofessional work required for admission to the schools of Pharmacy; Education; and Government, Business, and International Affairs; and two-year terminal curricula in Accounting, Home Economics, Physical Sciences, and Secretarial Studies. The lower division is primarily concerned with providing (1) the personal and academic guidance needed by beginning college students and (2) the broad cultural foundations in language and literature, science, and social studies on which major field specialization in the upper division is built.

The upper division of Columbian College offers programs leading to Bachelor's degrees in the liberal arts and sciences; the graduate division offers programs leading to the Master's degrees.

The Degrees

Columbian College offers work leading to the following degrees: Associate in Arts, Associate in Science, Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science, and Master of Fine Arts. In cooperation with the School of Medicine, Columbian College offers work leading to the combined degrees of Bachelor of Arts and Doctor of Medicine. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

Undergraduate Majors

Curricula leading to the degree of Bachelor of Arts are available in the following major fields:

American Thought and Civilization
Art:
  Art History and Theory, Drawing and Painting, Sculpture, or Commercial Art
Biology
Botany
Chemistry
Economics
English Literature
French Language and Literature
Geography
Geology
Germanic Languages and Literatures
History
Journalism
Latin American Civilization
Mathematical Statistics
Mathematics
Philosophy
Physics
Political Science
Psychology
Religion
Russian
Sociology and Anthropology
Spanish American Literature
Spanish Language and Literature
Speech:
  Speech
  Dramatic Art
Zoology

Curricula leading to the degree of Bachelor of Science are available in the following major fields:

Biology
Botany
Chemistry
Geology
Mathematical Statistics
Mathematics
Physics
Zoology

Graduate Fields

Graduate work leading to the degree of Master of Arts or Master of Science is offered in the following fields. In addition, programs can be arranged in combined fields subject to the approval of the Committee on Studies.

American Literary and Cultural History
Anatomy
Art History and Criticism
Biochemistry
Biology
Botany
Chemistry
Chemotherapy
Economics
English and American Literature
English Literature
French Language and Literature
Geography
Geology
Germanic Languages and Literatures
History
Latin American Civilization
Mathematical Statistics
Mathematics
Microbiology
Pharmacology
Philosophy
Physics
Physiology
Political Science
Psychology
Religion
Religious Education
Sociology and Anthropology
Spanish American Literature
Spanish Language and Literature
Speech Correction
Statistics
Zoology

Graduate work leading to the degree of Master of Fine Arts is offered in the fields of painting and of sculpture and in the field of dramatic art.

Entrance Requirements

1. An acceptable certificate of graduation from an accredited secondary school, showing at least fifteen "units"*

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

2. The principal's statement that the applicant is prepared to undertake college work
3. Scores of the Scholastic Aptitude Test of the College Entrance Examination Board.

The Committee on Admission and Advanced Standing will consider the qualifications of an applicant who does not present all of the formal requirements stated above. The Committee may prescribe appropriate tests.

Distribution of Units for All Curricula.—Graduation from an accredited high school is accepted in lieu of any prescribed distribution of units. It is to be noted, however, that certain college courses have high school prerequisites, for example, one unit of algebra is required for college courses in chemistry, mathematics, physics, and statistics: one unit of plane geometry is prerequisite to courses in mathematics and physics. Applicants who do not meet the above mathematics requirements, may take algebra and plane geometry without college credit when they are offered by the Department of Mathematics.

A desirable high school program in preparation for college includes: four years of English, at least two years of one foreign language, two years of natural or physical science with laboratory instruction (exclusive of "General Sciences"), two or three years of social studies (with concentration on history), one or two years of basic mathematics.

The applicant is responsible for

a. Sending the report form obtained from the Admissions Office to his principal who will complete the form and forward it directly to the Director of Admissions.
b. Requesting a report of scores on the Scholastic Aptitude Test to be sent to the Director of Admissions by the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey. Write directly to the Board for information as to testing dates, fees, and center locations.

For the Master's Degrees.—An approved Bachelor's degree from an accredited higher institution; an appropriate distribution of courses; and a superior quality of work in the major field.

THE GRADUATE COUNCIL

The Graduate Council offers work leading only to the degree of Doctor of Philosophy. There is no specified amount of graduate work required for this degree beyond the first full year of graduate study. However, each student may be assigned whatever additional graduate course work his committee deems essential to his doctoral program. A limited amount of this graduate work is offered by some departments in the Summer Sessions. A student wishing to work under the disciplines of the Graduate Council will consult the Dean of the Graduate Council for information concerning credentials and candidacy.

A pamphlet describing details of the Graduate Council program, together with a current list of fields of research offered by the Council, will be sent upon request to the Office of the Graduate Council.

THE LAW SCHOOL

The Law School offers work leading to the degree of Bachelor of Laws; the Graduate School of Public Law offers work leading to the degrees of Master of Law, Master of Comparative Law, and Doctor of Juridical Science.

The Law School Application form contains an instruction sheet stating the credentials which are required.

See "Registration", on page 7 for provisions applicable to students who plan to take the New York Bar examination.

Entrance Requirements

Unclassified Students.—A degree candidate in good standing at another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student to earn credits for transfer to the other law school. Transfer students must previously have completed at least one year of law school work.

A member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this Law School.

For the Degree of Bachelor of Laws.—Students from other law schools which are members of the Association of American Law Schools may apply for transfer to this Law School with advanced standing. *No new students are admitted as candidates for the degree of Bachelor of Laws in the summer term.*

For the Degree of Master of Laws.—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a *B* average on all work done for the Bachelor of Laws degree, except that, at the discretion of the Committee on Graduate Studies, applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative.

For the Degree of Master of Comparative Law.—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycée, or lyceo: and (2) graduation in law from a recognized foreign university where training was in Civil Law.

For the Degree of Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools, and outstanding capacity for scholarly work in the field of law.

Continuing Legal Education Students.—A simplified admission and registration procedure is used for members of the bar who wish to take courses on a noncredit basis.

THE SCHOOL OF PHARMACY

The School of Pharmacy offers work leading to the degree of Bachelor of Science in Pharmacy.

Entrance Requirements

The satisfactory completion of the pre-Pharmacy curriculum in the lower division of Columbian College of Arts and Sciences, or the equivalent, is required.

THE SCHOOL OF EDUCATION

The School of Education prepares teachers, counselors, and administrators for the higher ranges of educational service and offers opportunities to teachers of experience to extend their education. The schedule of courses is arranged to meet the needs of employed students as well as those able to devote full time to their studies. It offers both graduate and undergraduate work.

The Degrees

The School of Education offers work leading to the following degrees: Bachelor of Arts in Education, Bachelor of Science in Home Economics, Bachelor of Science in Physical Education, Master of Arts in Education, and Doctor of Education.

Entrance Requirements

For the Bachelor's Degrees.—The satisfactory completion of two years of approved college work, or graduation from an approved two-year normal school, or the equivalent, is required.

For the Master's Degree.—A Bachelor's degree from an accredited college, or the equivalent, and the approval of the Committee on Admission and Advanced Standing are required.

For the Advanced Professional Certificate.—The Bachelor of Arts degree in Education or the Bachelor of Science degree in Physical Education from the School of Education, or the equivalent from another institution of higher learning; a Master's degree, from an accredited institution of higher learning, at least two years of successful teaching experience, and a permanent teaching or administrative license are required.

For the Doctor's Degree.—A Master's degree from an accredited college, or the equivalent, and the approval of the Faculty of the School of Education are required.

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

The Degrees

The School of Government, Business, and International Affairs offers work leading to the following degrees: (1) Bachelor of Arts in Government with a major in International Affairs or Public Affairs; (2) Bachelor of Business Administration with a major in Accounting, Business Administration, or Business and Economic Statistics; (3) Master of Arts in Government with a major field in International Affairs, Public Affairs, Public Administration, Personnel Administration, or Economic Policy; (4) Master of Business Administration with a major field in Accounting, Business and Economic Statistics, Controllership, General Business Administration, Hospital Administration, or Personnel Administration; and (5) Doctor of Business Administration.

The Master's degrees are based on completion of prescribed course work, the comprehensive examination, and thesis. The minimum Master's program is 30 semester hours of which 6 represent the thesis. Applicants whose undergraduate training does not include background courses necessary before taking the comprehensive examination must undertake programs longer than the 30-hour minimum.

Entrance Requirements

For the Bachelor's Degrees

Bachelor of Arts in Government.—The satisfactory completion of the *International Affairs* or *Public Affairs* curriculum in the lower division of Columbian College of Arts and Sciences, or the equivalent, is required.

Bachelor of Business Administration.—The satisfactory completion of the *Accounting, Business Administration,* or *Business and Economic Statistics* curriculum in the lower division of Columbian College of Arts and Sciences, or the equivalent, is required.

For the Master's Degrees

A Bachelor's degree from an accredited college or university is required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but may be required to take work above the minimum requirements.

Students admitted to candidacy must have attained a quality-point index of 3.00 (a *B* average) in the undergraduate major.

Specific entrance requirements for the degree of Master of Arts in Government in the fields of International Affairs, Public Affairs, Public Administration, Personnel Administration, and Economic Policy, are as follows:

International Affairs.—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major in international affairs at this University.

Public Affairs.—An undergraduate major in public affairs, economics, history, or political science, depending upon the field of specialization, is required.

Public Administration.—An undergraduate major in a social science or equivalent work experience is required.

Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology, is required.

Economic Policy.—An undergraduate major in economics at this University, or the equivalent, is required.

Specific entrance requirements for the degree of Master of Business Administration in the fields of Accounting, Business and Economic Statistics, Controllership, Personnel Administration, General Business Administration, and Hospital Administration are as follows:

Accounting.—An undergraduate major in accounting at this University, or the equivalent, is required.

Business and Economic Statistics.—An undergraduate major in business and economic statistics, or the equivalent, is required.

Controllership.—An undergraduate major in business administration with an option in controllership at this University, or the equivalent, is required.

Personnel Administration.—An undergraduate major in a social science or in education, with appropriate courses in psychology, is required.

General Business Administration.—A Bachelor of Business Administration degree at this University, or the equivalent, is required. Applicants who are deficient in such course work may be admitted and will be required to make up deficiencies over and above the normal Master of Business Administration program.

Hospital Administration.—Although students may be accepted with majors in any undergraduate field, a desirable background would include courses in accounting,

biology, business administration, economics, psychology, sociology, and statistics. One semester courses in accounting and in statistics must be taken prior to admission as a full-time graduate student. Applicants with academic deficiencies are encouraged to enroll in appropriate courses in the summer session. While a 3.00 average in the undergraduate major is expected, in the selection of candidates consideration will be given to personal qualifications, aptitude for hospital administration, and practical experience.

For the Doctor's Degree

Doctor of Business Administration.—A Master's degree in Business Administration or a related field, or the equivalent, and proficiency in statistics and accounting to the satisfaction of the Committee on Doctoral Studies are required.

THE COLLEGE OF GENERAL STUDIES

The College of General Studies supplements the adult education program of the University through its Campus Division, Off-Campus Division, and Division of Community Services. Programs leading to the following degrees are offered for mature students whose background and experience entitle them to registration in a college designed to meet individual needs: Associate in Arts; Associate in Science; Associate in Secretarial Administration; Bachelor of Arts; Bachelor of Science in Cartography; Master of Arts in the fields of Controllership, Governmental Administration, and Personnel Management; Master of Arts in International Affairs; and Master of Business Administration.

Entrance Requirements

Off-Campus Credit Courses.—A simplified procedure is used for admission and registration in off-campus courses. Transcripts of previous academic work are not required. Registration is restricted to those whose qualifications would indicate that they are able to carry the course successfully. Admission to an off-campus course does not constitute admission to degree candidacy in the University.

Noncredit Courses.—In general, noncredit courses will be open to any individual interested in enrolling. When a noncredit course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. A limit on the size of classes may have to be imposed in order to maintain the quality of instruction.

The separate catalogue of the College of General Studies, available at the College, 706 Twentieth Street NW., Washington 6, D. C., contains full information concerning programs, courses, entrance and degree requirements, and fees.

THE DIVISION OF UNIVERSITY STUDENTS

The Division of University Students makes the work of the University, in its several colleges and schools, accessible to three types of students who are not working toward a degree in this University (see pages 6 and 7).

THE DIVISION OF SPECIAL STUDENTS

This is a nondegree-granting division of the University in which students are enrolled to make up entrance deficiencies to degree-granting colleges and schools of the University.

COURSES OF INSTRUCTION

Explanation of Course Numbers

First-group courses.—Courses numbered from 1 to 100 are planned for the student in the freshman or sophomore year. With the approval of the adviser and the dean, they may also be taken by a junior or senior. In certain instances, they may be taken by a graduate student to make up undergraduate deficiencies or as prerequisites to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for the student in the junior or senior year. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for the graduate student. They are open, with the approval of the officer of instruction, to the qualified senior; they are not open to the freshman or sophomore student.

In the Law School, first-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses, from 401 to 500.

Indication of the Amount of Credit

The number of hours of credit given for the satisfactory completion of a course is in most cases indicated in parentheses after the name of the course.

The Schedule of Classes for the Summer Sessions, which will be available in April at the Office of the Registrar, will contain information about room assignments and instructors for courses.

The University reserves the right to change or withdraw any of the courses of instruction listed.

ACCOUNTING

1 *Introductory Accounting* (3)

Basic principles underlying accounting records used by single proprietorships and partnerships; preparation of the work sheet and financial statements. MTWThF 8:10–9:00 A.M.

1–2 *Introductory Accounting* (3–3)

First half: basic principles underlying accounting records used by single proprietorships and partnerships; preparation of the work sheet and financial statements. *Second half:* basic principles underlying accounting records used by corporations; introduction to valuation and amortization problems, cost accounting, and analysis and interpretation of financial statements. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor. Accounting 2 begins July 16. MTWThF 7:10–9:00 P.M.

101 *Cost Accounting* (3)

Theory and purposes of industrial cost accounting, treatment of systems of cost control and determination, analysis and interpretation of cost data. Emphasis will be on job order cost accounting. Prerequisite: Accounting 1–2. MTTh 5:35–7:00 P.M.

111 *Financial Statement Analysis* (3)
Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1–2 or permission of the instructor. MTWTh 7:00–8:05 A.M.

115 *Survey of Accounting* (3)
Accounting systems used by single proprietorships and corporations with emphasis on methods of compiling, analyzing, classifying, and summarizing accounting data. Valuation, amortization, and income determination problems. Not open for credit to Accounting or Business Administration majors. MW 6:10–8:25 P.M.

191 *Advanced Accounting* (3)
Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121–22. MTTh 5:35–7:00 P.M.

193 *Business Budgeting* (3)
Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1–2. MTTh 9:10–10:35 A.M.

231 *Contemporary Accounting Theory* (3)
Advanced accounting principles and concepts and recent theories concerned with the valuation and amortization of assets and determination of income. Admission by permission of the instructor. TTh 7:10–9:25 P.M.

275 *Internal Control and Auditing* (3)
Internal accounting controls; review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitableness. Emphasis on the use of internal control and auditing as an aid to management. Prerequisite: Accounting 171 or permission of the instructor. MW 7:10–9:25 P.M.

299–300 *Thesis* (3–3)

Course Offered in Special Program

In addition to the regular courses announced above, the University offers the following accounting course for students enrolled in the Navy Graduate Comptrollership Program.

3 *General Accounting* (3)
For students in the Navy Graduate Comptrollership program only. Study of accounting systems used by single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

ART

Art History and Theory

1 *Art Appreciation* (3)
A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and the ideas in art through the ages. (Primarily for nonmajors.) MTWThF 6:10–7:00 P.M.

71 *Introduction to the Arts in America* (3)
From the Colonial beginnings to the Republican Age. MTWTh 8:55–10:00 A.M.

106 *Renaissance Art in the North* (3)
A study of the painting in the Netherlands, Germany, France, Spain, and Portugal. MTWThF 5:10–6:00 P.M.

110 *Contemporary Art* (3)
Painting and sculpture in 20th century Europe. MTWTh 11:10 A.M.–12:15 P.M.

203 *Primitive Art** (3)
The arts of prehistoric and primitive man in Europe in the pre-Columbian Americas, Oceania, and Africa. MTWTh 2:10–3:15 P.M.

248 *Studies in Classical Art* (3)
MW 7:10–9:25 P.M.

289–90 *Thesis* (3–3)

Drawing and Painting†

21 *Basic Composition and Techniques* (3)
Study of the fundamentals of two- and three-dimensional composition; an investigation of materials and their application. MTWThF 9:00–12:00 A.M.

41 *Drawing and Perspective* (3)
An introductory course in object and figure drawing and mechanical perspective. MTWThF 1:00–4:00 P.M.

65 *Drawing and Painting I—Life, Still Life, and Portrait* (3)
MTWThF 9:00–12:00 A.M.

135 *Commercial Design*‡ (3)
Studies of the principles and applications of graphic design. MTWThF 1:00–4:00 P.M.

165 *Drawing and Painting II—Life and Portrait*§ (3)
MTWThF 9:00–12:00 A.M.

175 *Advanced Composition* (3)
Advanced problems in creative design and composition; development of representational skills. MTWThF 9:00–12:00 A.M.

265 *Painting III*§ (3)
MTWThF 9:00–12:00 A.M.

275 *Painting IV*§ (3)
MTWThF 9:00–12:00 A.M.

299–300 *Thesis* (3–3)

Music

3 *Music Appreciation* (3)
General study of musical style and elements related to listening analysis and understanding of music of all periods. MTWTh 1:10–2:15 P.M.

103 *History of Music* (3)
Survey of music of Western World civilization from the Early Christian to the Baroque Era. MTWTh 11:10 A.M.–12:15 P.M.

BIOLOGY

1–2 *Survey in Biology* (3–3)
Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to organic evolution, heredity, public health, and conservation. Material fee, $7 for each half. Nine week term. Biology 1 is not prerequisite to Biology 2. Biology 2 begins July 19 and ends August 20. Lectures, laboratories, and field trips—MTWThF 1:10–5:00 P.M.

115 *Cytology* (3)
Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Prerequisite: one

* May be taken for undergraduate credit with the approval of the instructor.
† Art 21 22 is prerequisite to all other studio courses. Classes in the practice of art are held at the Corcoran School of Art.
‡ Registration subject to approval of instructor.
§ May be taken for 6 semester hours with the approval of the instructor.

year of college work in biology, botany, or zoology. Material fee, $8. Four and one-half week term: June 19 to July 18. Lecture and laboratory—MTWThF 6:10–9:00 P.M.

211–12 *Research in Cytology* (arr.)
Individual problems for advanced students interested in this field. Hours and credits to be arranged.

299–300 *Thesis* (3–3)

BOTANY

1 *General Botany* (3)
Study of the structure, activities, and development of the flowering plant; survey of the different kinds of plants, their evolution, ecological relationships, economic significance, and principles of inheritance. Material fee, $7. Lecture and laboratory—TTh 9:10–12:00 A.M.; F 9:10–10:00 A.M.

2 *General Botany* (3)
Continuation of Botany 1. May be taken concurrently with Botany 1. Material fee, $7. Lecture and laboratory—MW 9:10–12:00 A.M.; F 10:10–11:00 A.M.

116 *Plant Growth* (3)
A course, primarily for nonspecialists, emphasizing practical problems of growing and caring for plants. Prerequisite: Botany 1 or Biology 1, or permission of the instructor. Material fee, $8. Lecture and laboratory—TTh 6:10–8:00 P.M.

295 *Research* (arr.)
Hours, credits, and fees to be arranged.

299–300 *Thesis* (3–3)

BUSINESS AND PUBLIC ADMINISTRATION

BUSINESS ADMINISTRATION

102 *Fundamentals of Management* (3)
Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking. TTh 2:10–4:40 P.M.

105 *Personnel Management* (3)
Industrial personnel and manpower programs, organization and policy in personnel activities. TTh 5:30–8:00 P.M.

138 *Investments* (3)
Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1–2. MW 5:30–8:00 P.M.

141 *Principles of Marketing* (3)
An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1–2. MTWTh 7:00–8:05 A.M.

153 *Principles of Personal Selling* (3)
Basic principles that underlie personal selling and the practical application of these principles. Emphasis is given to the human factor. Career opportunities and the role of selling in our economy are also considered. MW 5:30–8:00 P.M.

201 *Advanced Management* (3)
An advanced course in management emphasizing principles of management in relation to business enterprise. TTh 6:10–8:00 P.M.

232 *Seminar in Business Finance* (3)
Research in advanced financial problems. MW 8:10–10:00 P.M.

293 *Business Research* (3)
TTh 6:10–8:00 P.M.

299–300 *Thesis* (3–3)
Hours to be arranged.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the following business administration courses for students enrolled in special programs.

107 *Labor-Management Contracts* (3)
For students in the Air Force Advanced Management program only. Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations. Hours to be arranged.

268 *Management Engineering* (3)
For students in the Air Force Advanced Management program only. Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys, including the study of work measurement, work simplification, management audits, and other management improvement programs.

269 *Readings and Conferences in Controllership* (3)
For students in the Navy Graduate Financial Management program only.

275 *Human Relations in Business* (3)
For students in the Navy Graduate Financial Management program only.

HOSPITAL ADMINISTRATION

285 *Readings in Medical Care Administration* (3)
Advanced studies in various aspects of hospital, nursing home, and other medical care administration and management. Admission by permission of the instructor. Hours to be arranged.

296 *Hospital Residency* (3)
First third of the residency year which extends for 12 months beginning in June. Work experience in a hospital under a qualified preceptor; periodic seminars with University staff or special studies; periodic progress reports and a report of investigation submitted in the form of a thesis. Hours to be arranged.

PUBLIC ADMINISTRATION

211 *Problems of Governmental Organization* (3)
Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships. MW 8:10–10:00 P.M.

212 *Case Studies in Administration* (3)
Analysis and discussion of problems in public management, approached by the group using primarily the case method. MW 6:10–8:00 P.M.

251A *Governmental Budgeting* (3)
The role of budgeting in management; the principles and practices of budgetary formulation and administration. TTh 6:10–8:00 P.M.

297 *Seminar in Public Administration* (3)
Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships. TTh 8:10–10:00 P.M.

299–300 *Thesis* (3–3)
Hours to be arranged.

Course Offered in Special Program

In addition to the regular courses announced above, the University offers the following public administration course for students enrolled in the Air Force Advanced Management Program.

251B *Governmental Budgeting* (3)
The role of budgeting in management; the principles and practices of budgetary formulation and administration.

CHEMISTRY

11–12 *General Chemistry** (4–4)
Elementary course in general chemistry. Prerequisite: one year of high school algebra. Students with credit for one semester of general chemistry (college level) may enter Chemistry 12 on July 19. Laboratory fee, $18 for each half. Nine-week term ends August 20. MTWThF 8:30 A.M.–1:20 P.M.

21 *Qualitative Inorganic Analysis* (4)
Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12. Laboratory fee, $18. Eight-week term. TWThF 1:10–5:00 P.M.

22 *Quantitative Inorganic Analysis I* (4)
Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, $18. Eight-week term. TW ThF 1:10–5:00 P.M.

151–52 *Organic Chemistry** (4–4)
Chemistry of the compounds of carbon. Prerequisite†: Chemistry 21. Chemistry 151 laboratory fee, $11; Chemistry 152 laboratory fee, $18. Students who have credit for Chemistry 151 may enter Chemistry 152 on July 19. Nine-week term ends August 20. MTWThF 8:30 A.M.–1:20 P.M.

295–96 *Research* (arr.)
Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, $7.50 a semester hour. Hours and credits to be arranged.

299–300 *Thesis* (3–3)
Laboratory fee, $18 each half. Hours to be arranged.

ECONOMICS‡

1 *Principles of Economics*‡ (3)
Survey of the major economic principles, institutions, and problems in contemporary life. MTWThF 9:10–10:00 A.M. or MTWTh 5:55–7:00 P.M.

2 *Principles of Economics* (3)
Continuation of Economics 1. Prerequisite: Economics 1. MTWTh 11:10 A.M.–12:15 P.M. or MTWTh 7:10–8:15 P.M.

101 *Economic Analysis* (3)
Analysis of demand, supply, and commodity pricing; theory of national income determination; pricing of productive services; welfare economics. MTWTh 7:55–9:00 A.M.

121 *Money and Banking* (3)
Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems. MTWTh 12:25–1:30 P.M.

* Full-year course; credit is not given until the second half of course is completed.
† This prerequisite may be waived in the case of the student who has earned a grade of *C* or better in Chemistry 12 within the past two years.
‡ Economics 1–2 is prerequisite to all other courses in Economics.

181 ***International Economics*** (3)
Survey of world economics, theories of international trade, analysis of international economic problems, and the international organizations. MTWTh 5:55–7:00 P.M.

213 ***Economic Thought in the Twentieth Century*** (3)
Continuation of Economics 201–2. The principal trends in economic thought during the present century. TTh 6:10–8:00 P.M.

219 ***Managerial Economics*** (3)
Analysis of price, production, and inventory policies of business firms. MW 6:10–8:00 P.M.

251 ***Theories of Economic Development*** (3)
Growth and change in economic activity, capital accumulation, innovations in technology and business organization. TTh 8:10–10:00 P.M.

299–300 ***Thesis*** (3–3)

Course Offered in Special Program

In addition to the regular courses announced above, the University offers the following economics course for students enrolled in the Navy Graduate Financial Management program.

195 ***Governmental and Industrial Economics*** (3)
Survey of national income, the financial system, international economics, and public economic policy.

EDUCATION (*See* pages 39–43)

ENGLISH*

ENGLISH COMPOSITION

A ***English for Foreign Students*** (3)
A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary. MTWThF 7:10–8:00 P.M.

1 ***English Composition**** (3)
Review of grammar, exercises in composition, readings. MTWThF 9:10–10:00 A.M. or MTWThF 6:10–7:00 P.M.

1X ***English Composition**** (3)
An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets for a period and a half five times a week and carries 3 semester hours of credit. The tuition fee is $115 (the regular fee of $30 a semester hour, plus an additional fee of $25). MTWThF 11:10 A.M.–12:40 P.M. or MTWThF 6:10–7:40 P.M.

2 ***English Composition**** (3)
For second-semester freshmen not following the Columbian College of Arts and Sciences sequence. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X. MTWThF 10:10–11:00 A.M. or MTWThF 7:10–8:00 P.M.

4 ***English Composition**** (3)
The second half of the six-hour English Composition course required of students in Columbian College of Arts and Sciences sequence. A course in critical analysis and

* See footnote page 26.

practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X and both semesters of one of the introductory literature courses. MTWThF 11:10–12:00 A.M.

11 *The Writing of Reports* (3)
Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X and 2 or 4. MTWTh 5:55–7:00 P.M.

ENGLISH LITERATURE†

51 *Introduction to English Literature* (3)
A historical survey, from beginnings to 1800. MTWThF 9:10–10:00 A.M. or MTWTh 7:10–8:15 P.M.

52 *Introduction to English Literature* (3)
A historical survey, literature since 1800. MTWTh 5:55–7:00 P.M.

122 *English Literature from the Beginnings to 1500* (3)
Chaucer. MTWTh 5:55–7:00 P.M.

139 *The Seventeenth Century* (3)
Poetry and prose from 1603 to 1660. MTWThF 10:10–11:00 A.M.

166 *The Twentieth Century* (3)
Fiction and drama since 1900. MTWTh 1:10–2:15 P.M.

236 *Studies in Shakespeare and His Contemporaries* (3)
Prerequisite: English 135–36 or the equivalent. Open to undergraduates with permission of the instructor. TTh 8:00–10:00 P.M.

AMERICAN LITERATURE‡

71 *Introduction to American Literature* (3)
A historical survey, from beginnings to 1860. MTWTh 11:10 A.M.–12:15 P.M. or MTWTh 5:55–7:00 P.M.

72 *Introduction to American Literature* (3)
A historical survey, literature since 1860. MTWTh 7:10–8:15 P.M.

174 *Major American Poets* (3)
The 20th century. MTWTh 5:55–7:00 P.M.

176 *American Drama* (3)
Critical study of 20th century drama. MTWTh 11:10 A.M.–12:15 P.M.

FRENCH (*See* Romance Languages and Literatures, pages 33 and 34)

GEOGRAPHY

51 *Introduction to Geography* (3)
A study of place attributes and characteristics; patterns and associations of physical and cultural earth features. MTWThF 8:10–9:00 A.M.

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* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

All students enrolled in curricula leading to Bachelor's degrees in Columbian College of Arts and Sciences (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.

English 1 or 1X is prerequisite to all other courses in English. English 2 is the second half of the six-hour composition course requirement of students *not* required to follow the Columbian College of Arts and Sciences sequence.

† English 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second-group courses except English 125.

‡ English 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second-group courses except English 171–72.

52 *World Regions* (3)
The analysis of world regional divisions, descriptions and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man. MTWThF 9:10–10:00 A.M.

137 *Industrial Planning for Underdeveloped Areas* (3)
The appraisal of industrial development potentials in non-industrial areas; the preparation and implementation of industrial development plans; peculiar problems of industrial development in traditional societies; the role of industrialized countries, with particular emphasis on United States responsibilities. TTh 6:00–8:00 P.M.

251 *Seminar: World Problem Areas* (3)
A study of those parts of the world which have become matters of international concern, whether because of their political or social instability, unsound economic development, or aggressive tendencies. An evaluation of the complex of factors which have created the "problems". MW 6:00–8:00 P.M.

GERMANIC LANGUAGES AND LITERATURES*

1–2 *First-year German* (3–3)
Full-year course: credit is not given for German 1 until German 2 is completed. The essentials of German grammar, translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 each half.† Second half begins July 16. Lecture MTWThF 9:10–11:00 A.M. or MTWThF 6:10–8:00 P.M.; workshop —to be arranged.

3–4 *Second-year German* (3–3)
Full-year course: credit is not given for German 3 until German 4 is completed. Selections from modern German prose; review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, $6 each half.† Prerequisite: German 1-2 or two years of high school German. Second half begins July 16. Lecture MTWThF 9:10–11:00 A.M. or MWF 6:10–8:00 P.M. and TTh 7:10–9:00 P.M.; workshop—to be arranged.

47 *Beginning German for Reading Examination Candidates* (0)
This course carries no credit. Tuition fee, $90 for all students except doctoral candidates. MTWTh 5:55–7:00 P.M.

49 *German Readings for Nonmajor Students* (3)
Primarily for students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or German 47. MTWTh 5:55–7:00 P.M.

HISTORY‡

39 *The Development of European Civilization* (3)
Primarily for freshmen. The political, social, economic, and cultural history of the Old World from ancient times to 1715. MTWTh 5:55–7:00 P.M.

40 *The Development of European Civilization* (3)
Primarily for freshmen. The political, social, economic, and cultural history of the Old World from 1715 to the present. MTWThF 8:00–8:50 A.M.

71 *The Development of the Civilization of the United States* (3)
Primarily for sophomores. The political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. MTWTh 7:55–9:00 A.M.

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* A standardized placement examination administered at registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination assignment is made to the appropriate course, with credit assigned on the usual basis.

† Students registering for German 1–2 or 3–4 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add slip from the Department.

‡ History 39–40 is prerequisite to courses 109 through 152 and 190 through 196; History 71–72, to courses 171 through 184; either History 39–40 or 71–72, to courses 161 through 166.

72 *The Development of the Civilization of the United States* (3)
Primarily for sophomores. The political, social, economic, and cultural forces of the United States in their world setting from 1865 to the present. MTWThF 10:10–11:00 A.M. or MTWTh 5:55–7:00 P.M.

130 *Nationalism* (3)
The historical evolution of modern Nationalism. MTWThF 8:00–8:50 A.M.

162 *Iberian Background of Latin America* (3)
History of Spain and Portugal, with emphasis on developments leading to the rise and decline of the Spanish and Portuguese empires. MTWTh 5:55–7:00 P.M.

164 *South America since Independence* (3)
Development of the independent South American states in the 19th and 20th centuries. MTWTh 7:10–8:15 P.M.

172 *Social History of the United States* (3)
The Urban-Industrial Era, 1861 to present time. MTWThF 10:10–11:00 A.M.

173 *Representative Americans* (3)
A biographial approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform. MTWThF 9:10–10:00 A.M.

175 *Political and Constitutional History of the United States* (3)
To the eve of the Civil War. MTWTh 11:10 A.M.–12:15 P.M.

291 *Seminar* (3)
Prerequisite: approval of the Department. Hours to be arranged.

299–300 *Thesis* (3–3)
Required of all candidates for the Master's degree specializing in history. Hours to be arranged.

JOURNALISM

111 *Reporting* (3)
Instruction and classroom practice in gathering, evaluating, and writing news; emphasis on newspapers, other media considered. MTWThF 10:10–11:00 A.M.

115 *Editing and Make-up* (3)
Editing of news and other material for publication, typography and display; use of pictures and other graphic presentations. MTWThF 11:10–12:00 A.M.

121 *Advanced Reporting: Magazine Feature Articles* (3)
Instruction and practice in writing magazine articles, material for which is obtained through independent investigation. MTWTh 1:10–2:15 P.M.

LAW (*See* pages 37–39)

MATHEMATICS

2 *General Mathematics* (3)
For students in the School of Education. A study of basic concepts of elementary mathematics: propositional logic, mathematical proof, number systems, number notations, functions, computations in arithmetic and algebra, and geometric measurement. MTWTh 5:55–7:00 P.M.

3 *College Algebra* (3)
Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry. MTWThF 10:10–11:00 A.M. or MTWTh 5:55–7:00 P.M.

6 *Plane Trigonometry* (3)
Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor). MTWThF 9:10–10:00 A.M. or MTWTh 7:10–8:15 P.M.

12 *Analytic Geometry* (3)
Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry. MTWThF 11:10–12:00 A.M. or MTWTh 5:55–7:00 P.M.

29 *Calculus I* (3)
Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12. MTWThF 10:10–11:00 A.M. or MTWTh 7:10–8:15 P.M.

30 *Calculus II* (3)
Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29. MTWThF 9:10–10:00 A.M. or MTWTh 5:55–7:00 P.M.

31 *Calculus III** (3)
Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor) or Mathematics 20. MTWThF 10:10–11:00 A.M. or MTWTh 7:10–8:15 P.M.

111 *Mathematics for Engineers and Physicists I* (3)
Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31. MTWThF 11:10–12:00 A.M.

112 *Mathematics for Engineers and Physicists II* (3)
Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132. MTWTh 5:55–7:00 P.M.

124 *Introduction to Matrix Theory* (3)
Elementary theory of finite vector spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices. MTWTh 5:55–7:00 P.M.

139 *Advanced Calculus I* (3)
Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings. MTWThF 11:10–12:00 A.M.

295–96 *Reading and Research* (3–3)
Hours to be arranged.

299–300 *Thesis* (3–3)
Hours to be arranged.

PHARMACY

192 *Hospital Pharmacy: Prescription Practice* (1)
Prescription practice in the University Hospital Pharmacy. Prerequisite: Pharmacy 102. Laboratory—hours to be arranged.

PHILOSOPHY

51 *Introduction to Philosophy* (3)
A critical examination of some of the problems of modern philosophy in relation to scientific and social developments since the Renaissance. TWTh 8:35–10:00 A.M.

172 *American Philosophy* (3)
The philosophies of Peirce, Royce, James, Dewey, and Santayana as representative of American thought. TWTh 11:10–12:35 P.M.

* Mathematics 31 is prerequisite to all second-group courses.

193 ***Topics in Contemporary Philosophy*** (3)
Intensive study of one selected topic in contemporary philosophic literature. TWTh 5:35–7:00 P.M.

PHYSICS

11 ***Introductory Physics*** (3)
An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, $11. *First half* of nine-week term—ends July 18. Lecture and laboratory—MWF 1:10–4:30 P.M.; recitation—TTh 1:10–3:00 P.M.

12 ***Introductory Physics*** (3)
Mechanics, wave-motion, and sound. Prerequisite: Physics 11 (or former Physics 5). Material fee, $11. *Second half* of nine-week term—July 19–August 20. Lecture and laboratory—MWF 1:10–4:30 P.M.; recitation—TTh 1:10–3:00 P.M.

13 ***Introductory Physics*** (3)
Elementary electricity and magnetism. Prerequisite: Physics 11. Students who have completed trigonometry may take this course concurrently with Physics 11. Material fee, $11. Lecture—TTh 6:10–7:00 P.M.; recitation and laboratory—MW 6:10–9:30 P.M.

POLITICAL SCIENCE*

1 ***Introduction to Government**** (3)
Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations. MTWThF 10:10–11:00 A.M.

9 ***Government of the United States**** (3)
The structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. MTWThF 11:10–12:00 A.M. or MTWTh 7:10–8:15 P.M.

107 ***Problems in Modern Political Thought*** (3)
Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries. MTWThF 10:10–11:00 A.M.

111 ***Introduction to Comparative Government*** (3)
Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France. MTWTh 5:55–7:00 P.M.

145 ***Political Parties and Politics*** (3)
Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress. MTWTh 7:10–8:15 P.M.

151 ***Public Administration*** (3)
Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests. MTWThF 9:10–10:00 A.M.

171 ***International Politics*** (3)
Basic forces underlying the conduct of international relations and the formation of foreign policy: power politics, imperialism, collective security, and international cooperation. MTWTh 5:55–7:00 P.M.

172 ***International Organization: The United Nations*** (3)
Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations. MTWThF 11:10–12:00 A.M.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

181 *International Law* (3)
Survey of the public law of nations with particular emphasis on the law of peace. MTWThF 10:10–11:00 A.M.

197 *Proseminar in Foreign Affairs* (3)
Reading and discussion course for coordination and review. Primarily for seniors in the International Affairs major. TTh 2:10–4:00 P.M.

213 *Readings in Comparative Government* (3)
Readings and group discussions on comparative political and administrative institutions with attention to legislatures, the changing role of the executive, political parties, constitutional and totalitarian approaches to public management and public service, the role of the military, etc. TTh 8:10–10:00 P.M.

277 *Seminar: Latin American Government* (3)
Analysis of the political structures of selected Latin American republics. Two comparable governments studied. MW 8:20–10:10 P.M.

279 *Reading Course in International Affairs* (3)
Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization. TTh 8:10–10:00 P.M.

281 *Seminar: International Law and Relations* (3)
Research in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications. MW 8:10–10:00 P.M.

299–300 *Thesis* (3–3)
Hours to be arranged.

PSYCHOLOGY*

1 *General Psychology** (3)
The fundamental principles underlying human behavior. MWTh 8:35–10:00 A.M. or MWTh 5:35–7:00 P.M.

4 *Psychology of Adjustment* (3)
Processes involved in the total adjustment of the individual, with emphasis on social environment; development in the individual of adjustment techniques. MWTh 5:35–7:00 P.M.

29 *Child Psychology* (3)
A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world. MWTh 11:10 A.M.–12:35 P.M.

98 *Abnormal Psychology* (3)
The causes, diagnosis, treatment, and prevention of the various types of maladjustment and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science. MWTh 8:35–10:00 A.M.

118 *Physiological Psychology* (3)
Structure, function, and phylogeny of receptors, nervous system, and effectors as mediators of behavior, including drives, learning, and emotions. MTTh 1:10–2:35 P.M.

129 *Introduction to Counseling and Guidance* (3)
A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling. MWTh 7:10–8:35 P.M.

131 *Psychological Tests* (3)
A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7. MWTh 11:10 A.M.–12:35 P.M.

* Psychology 1 is prerequisite to all other courses in Psychology. Six credits in courses from 1 to 100 are prerequisite to all courses from 100–200.

151 *Social Psychology* (3)
The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war. MWTh 5:35–7:00 P.M.

156 *Psychology of Propaganda and Public Opinion* (3)
The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare. MWTh 7:10–8:35 P.M.

193 *Readings in Psychology* (3)
Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality-point index of 3.00 or higher. Permission of staff member under whom course is to be taken is necessary. Hours to be arranged.

196 *History and Systems of Psychology* (3)
A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology. MWTh 7:10–8:35 P.M.

202 *Psychological Research Methods and Procedures* (3)
Required of all Master's candidates in psychology. Prerequisite: Experimental Psychology and an elementary course in statistics. MW 7:10–9:00 P.M.

207 *Readings in Psychology for Graduate Students* (3)
Supervised readings with conferences on specified topics in psychology. Permission of staff member under whom course is to be taken is necessary. Hours to be arranged.

218 *Seminar: Clinical Psychology—Psychopathology* (3)
Covers basic etiological factors in behavioral and psychological deviations and disorders. TTh 7:10–9:00 P.M.

244 *Seminar: Job Analysis and Evaluation* (3)
Techniques for the development of work performed descriptions, qualifications analysis, and job demands specifications. The evaluations and classification of jobs for the purpose of establishing wage structures. MW 7:10–9:00 P.M.

281 *Practicum in Counseling* (3)
Supervised practical instruction in agencies doing counseling. Prerequisite: graduate work in counseling. Admission by permission of the Chairman of the Department. Hours to be arranged.

283 *Practicum in Clinical Psychology* (3)
Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psychology 212 and 233. Admission by permission of the Chairman of the Department. Hours to be arranged.

289 *Seminar: Current Research and Theory in Psychology* (3)
A review and discussion of contemporary research and theory in some advanced and specialized field of psychological study, by leaders in the field. The specific topic will be announced in the Schedule of Classes. TTh 7:10–9:00 P.M.

295–96 *Research in Psychology* (arr.)
Hours and credits to be arranged.

299–300 *Thesis* (3–3)
Hours to be arranged.

COURSES OFFERED IN NINE-WEEK EDUCATION SESSION

228 *Seminar: Techniques of Counseling** (3)
An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, in

* A workshop course requiring the full daytime attention of enrollees. Concurrent registration for another course scheduled in morning or afternoon not permitted.

cluding Psychology 229 and 236. In exceptional cases Psychology 229 or 236 may be taken concurrently with 228. July 30 to August 17. Lecture and conference—morning; small group discussions and field work—afternoon.

236 *Seminar: Analysis of the Individual for Purposes of Counseling** (3)
A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements. July 9 to 27. Lecture and conference—morning; small group discussions and field work—afternoon.

Course Offered in Engineering Administration Program

145 *Principles of Human Relations* (3)
A basic course in the psychological principles underlying human relations. TTh 6:10–8:15 P.M.

RELIGION

9 *The Old Testament* (3)
A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities. MWF 8:35–10:00 A.M.

10 *The New Testament* (3)
A study of the literature of the New Testament from the standpoint of occasion, purpose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles. TWTh 7:10–8:35 P.M.

60 *History of Religion* (3)
Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status. MWF 11:10–12:35 P.M.

172 *Religion in American Culture* (3)
Growth of religious bodies and institutions in American culture, the heritage of religious freedom and diversity, religion and literature, revivalism and education, science and religious thought, divisions and cooperative movements in religion. TWTh 5:35–7:00 P.M.

291–92 *Readings and Research* (3–3)
Investigation of special problems in the history of religion. Hours to be arranged.

299–300 *Thesis* (3–3)

ROMANCE LANGUAGES AND LITERATURES†

FRENCH

1–2 *First-year French* (3–3)
Pronunciation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop. Full-year course: credit will not be given for French 1 until French 2 is completed. Workshop fee, $6 for each half.‡ Second half begins July 16. Lecture—MTWThF 8:10–10:00 A.M. or MTWThF 6:10–8:00 P.M.; workshop—to be arranged.

3–4 *Second-year French* (3–3)
Advanced grammar and composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, $6 for each half.‡ Full-year course: credit will not be given for French 3 until French 4 is completed. Prerequisite: French 1–2 or two years of high school French. Second half begins July 16. Lecture—MTWThF 8:10–10:00 A.M. or MTW ThF 6:10–8:00 P.M.; workshop—to be arranged.

* A workshop course requiring the full daytime attention of enrollees. Concurrent registration for another course scheduled in morning or afternoon not permitted.

† A standardized placement examination administered at registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination assignment is made to the appropriate course, with credit assigned on the usual basis.

‡ Students registering for French 1–2 or 3–4 or Spanish 1–2 or 3–4 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add slip from the Department.

9–10 *French Conversation and Composition* (3–3)
Prerequisite: French 4 or the equivalent and permission of the instructor. Second half begins July 16. MTWThF 8:10–10:00 A.M.

19 *French Readings for Nonmajor Students* (3)
Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students. MTWThF 6:10–7:00 P.M.

129 *Contemporary French Literature* (3)
Existentialism and surrealism in the novel, poetry, and drama from 1938 to the present. Lectures, discussions, and reports. MTWThF 6:10–7:00 P.M.

SPANISH

1–2 *First-year Spanish* (3–3)
Pronunciation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language workshop. Full-year course: credit will not be given for Spanish 1 until Spanish 2 is completed. Workshop fee, $6 for each half.* Second half begins July 16. Lecture—MTWThF 8:10–10:00 A.M. or MTWThF 6:10–8:00 P.M.; workshop—to be arranged.

3–4 *Second-year Spanish* (3–3)
Advanced grammar and composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language workshop. Workshop fee, $6 for each half.* Full-year course: credit will not be given for Spanish 3 until Spanish 4 is completed. Prerequisite: Spanish 1–2 or two years of high school Spanish. Second half begins July 16. Lecture—MTWThF 8:10–10:00 A.M. or MTWThF 6:10–8:00 P.M.; workshop—to be arranged.

129 *Contemporary Spanish Literature* (3)
Developments in the novel, poetry, and drama of Spain from 1930 to the present. Lectures, discussions, reports. MTWThF 6:10–7:00 P.M.

SLAVIC LANGUAGES AND LITERATURES

1–2 *First-year Russian* (3–3)
Beginner's course in fundamentals of grammar and pronunciation, with graded reading, oral drill, and written practice. Full-year course: credit will not be given for Russian 1 until Russian 2 is completed. Workshop fee, $6 for each half.* Second half begins July 16. Lecture—MTWThF 6:10–8:00 P.M.; workshop—to be arranged.

9–10 *Russian Conversation* (3–3)
Listening comprehension and oral practice. Prerequisite: Russian 3–4 or permission of the instructor. Workshop fee, $6 for each half.* MTWThF 6:10–8:00 P.M.; workshop—to be arranged.

SOCIOLOGY AND ANTHROPOLOGY†

1 *Man in Modern Society* (3)
Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national and international disorganization. MTWThF 10:10–11:00 A.M.

51 *Introduction to Anthropology†* (3)
Physical development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships. MTWTh 7:10–8:15 P.M.

* Students registering for Spanish 1–2 or 3–4 or Russian 1–2 or 9–10 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add slip from the Department.

† Sociology and Anthropology 1 or 51 is a prerequisite to all other courses in Sociology and Anthropology.

143 *Language and Culture* (3)
The nature and significance of human communication, the distribution and dynamics of languages, linguistic changes, the role of language in culture. MTWTh 5:55–7:00 P.M.

162 *Social Movements* (3)
Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and show the way social movements develop. MTWThF 11:10–12:00 A.M.

295–96 *Research* (arr.)

299–300 *Thesis* (3–3)

SPANISH (*See* Romance Languages and Literatures page 34)

SPEECH

A *Speech Clinic*
Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, $7; for group lesson, $4. Hours to be arranged.

B *American Speech for Foreign Students* (3)
Class limited to foreign born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Analysis of individual voices through recordings. Recording fee, $5. MTWTh 5:55–7:00 P.M.

1 *Effective Speaking* (3)
Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, $2. MTWThF 9:10–10:00 A.M. or MTWTh 5:55–7:00 P.M.

11 *Voice and Diction* (3)
Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of sounds of English and the standards of speech. Recording fee, $4. MTWThF 10:10–11:00 A.M. or MTWTh 7:10–8:15 P.M.

32 *Oral Reading* (3)
Reading to others; theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11. Recording fee, $2. MTWThF 9:10–10:00 A.M.

121 *Group Discussion and Conference Leadership* (3)
The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor. MTWThF 11:10–12:00 A.M.

177 *Clinical Practice in Speech Therapy* (1)
Supervised case work in remedial speech—the University Speech Clinic, District of Columbia Crippled Children's Society, and Public School system. This course may be repeated for a total of 6 semester hours. Prerequisite: Speech 176 and permission of instructor. Hours to be arranged.

183 *Clinical Practice in Hearing Therapy* (1)
Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and the Veterans Administration Audiology Clinic. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of instructor. Hours to be arranged.

280 *Speech Pathology* (3)
An advanced study of the causes and symptoms of the major physiogenic and psychogenic disorders. Prerequisite: Speech 171 and 176. MTWThF 1:10–2:00 P.M.

295 *Research in Speech and Hearing* (arr.)
Hours to be arranged.

299–300 *Thesis* (3–3)
Hours to be arranged.

High School Speech Institute*

June 25 to August 3

Public Speaking
The fundamental principles and practice of public speaking. Emphasis on developing a sense of communication, poise, vocal and physical control, and in basic skills in the organization and development of ideas for informative, persuasive, and social speech purposes. Frequent and regular practice in the preparation and delivery of short speeches. MTWThF 10:10–11:00 A.M.

Voice Improvement
Emphasis on developing characteristics of effective use of voice for speech. Voice analysis to provide improvement in control and use of pitch, rate, force, and quality. Attention given to problems of articulation and pronunciation. Application through practice to oral reading, speaking, and acting. MTWThF 11:10–12:00 A.M.

Workshop in Forensics
The study and practice of debating, parliamentary law, oratory, and group discussion. The National High School debate and discussion topics form the basis for study of analysis, research methods, case construction, and practice in debate and discussion techniques. Attention given to preparation and delivery of orations suitable for such contests as "I Speak for Democracy," "The American Legion Oratorical Contests," and other competitions sponsored in area high schools. TTh 1:10–3:00 P.M.

Workshop in Theater
The study and practice of acting, play production, scenery, lighting, and make-up. Application to the dramatic monologue and arena style production of one-act plays, and scenes from three-act dramas. MW 1:10–3:00 P.M.

STATISTICS†

51 *Introduction to Business and Economic Statistics*† (3)
Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, $9. Lecture—TTh 8:20–10:00 A.M.; laboratory—MW 8:20–10:00 A.M.

104 *Statistics in Psychology and Education I* (3)
Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, $9. Lecture—MW 8:20–10:00 A.M.; laboratory—TTh 8:20–10:00 A.M.

106 *Factor Analysis* (3)
Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, $9. Lecture—MW 11:10 A.M.–12:50 P.M.; laboratory—MW 1:10–2:50 P.M.

107 *Statistics for Engineers* (3)
Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus. MW 5:30–8:00 P.M.

* Tuition for two courses and one workshop—$60.00. Tuition for additional workshop—$20.00. Registration day—Monday, June 25.
Courses in this program do not carry college credit.

† Of first-group courses, Statistics 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree.
Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

118 *Correlation and the Chi-square Test I* (3)
Regression and correlation theory: simple, partial, and multiple; nonparametric methods; analysis of covariance; contingency table analysis; tests of goodness of fit. Prerequisite: Statistics 91. Laboratory fee, $9. Lecture—MW 5:20–7:00 P.M.: laboratory—MW 7:10–8:50 P.M.

155 *Introduction to Mathematical Probability* (3)
Probability distributions. Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers, limit theorems. Prerequisite: differential and integral calculus. MW 5:30–8:00 P.M.

Courses Offered in Special Programs

In addition to the regular courses announced above the University offers the following courses in statistics for students enrolled in the special programs.

119 *The Bases of Statistical Decision Making* (3)
For students in the Navy Graduate Financial Management Program only. Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.

120 *Principles of Statistical Analysis* (3)
For students in the Air Force Advanced Management Program only. Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses.

ZOOLOGY

1–2 *Introduction to Zoology* (4–4)
An introduction to the study of the structure, functions, and relation of animals, and of the fundamental biological principles involved. Material fee, $11 for each half. Nine-week term. Zoology 2 begins July 19 and ends August 20. Lecture—MTWThF 6:10–7:00 P.M.; laboratory—MTWThF 7:10–10:00 P.M.

145 *Introduction to Vertebrate Embryology* (3)
Origin and early development of the individual, formation of organ systems. Emphasis on the frog, chick, and pig, with reference to the human embryo. Prerequisite: Zoology 2 or the equivalent. Material fee, $11. Lecture—MW 7:10–8:00 P.M.; laboratory—MW 8:10–10:00 P.M., TTh 7:10–9:00 P.M.

295 *Research* (3)
Investigation of special problems. Hours to be arranged.

299 *Thesis* (3)
Hours to be arranged.

LAW

First Session

June 12 to July 26

115 *Contracts I* (4)
Mutual assent, offer and acceptance, consideration, parol evidence rule, Statute of Frauds, third party beneficiaries, assignments, conditions. MTWThF 5:50–7:40 P.M.

202 *Administrative Law* (4)
The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies. MTWThF 5:50–7:40 P.M.

10 *Business Associations* (4)
Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share struc-

ture; problems of operation; relations between partners; roles of shareholders, direc tors, officers; control devices; distributions to owners; voluntary reorganization; disso lution and termination. MTWThF 9:10–11:00 A.M.

215 *Civil Procedure* (4)
Pleadings, discovery, joinder, forms of trial and related proof problems. Emphasis i on Federal Rules of Civil Procedure and other modern codes. MTWThF 10:10–12:0 A.M. or MTWThF 5:50–7:40 P.M.

235 *Domestic Relations* (2)
Marriage, annulment, and divorce; adoption and custody of children; economic rela tions. MTWThF 12:10–1:00 P.M.

238 *Equity* (2)
A correlation of aspects of equity considered in earlier courses, and inquiring into th nature of equity jurisprudence through analysis of selected problems in equity; his torical development of equity, including problems of merger of law and equity: use o equity jurisdiction offensively and defensively, including multi-party actions, injunc tion of executive and legal actions, and equitable abstention; emphasis on the fashion ing of equitable remedies. MTWThF 7:30–8:20 A.M.

295 *Unfair Trade Practices* (4)
Unfair trade practices at common law and under statutes; trade-marks, trade names copyright law; misappropriation of ideas; protection of competitors and consumer against false advertising under Federal Trade Commission Act; resale price mainte nance under state Fair Trade Acts; miscellaneous business practices. MTWThF 5:50 7:40 P.M.

309 *Conflict of Laws* (4)
Legal problems arising from occurrences transcending state or national boundaries jurisdiction; foreign judgments; constitutional influences; theoretical bases of choic of law principles and their application to specific fields, including torts, contracts property, family law, administration of estates, and business associations. MTWTh 9:10–11:00 A.M. or MTWThF 5:50–7:40 P.M.

355 *Mortgages* (2)
Security interests in real property, their creation, transfer, enforcement, and extin guishment. MT 5:50–8:05 P.M.

380 *Suretyship* (2)
The law of suretyship, especially in the context of accommodation credit and com mercial and financial practices, with attention also to informal and non-consensua suretyship relations and the place of suretyship principles in the solution of lega problems generally. ThF 5:50–8:05 P.M.

SECOND SESSION

July 30 to September 12

116 *Contracts II* (2)
Scope of protection afforded contracts; specific performance of contracts other th land transactions. MTh 5:50–8:05 P.M.

150 *Real Property* (4)
Historical background of the law of estates and conveyancing; types of estates; dow and curtesy; landlord and tenant relationship; concurrent estates; future interests common law and after Statute of Uses; Rule against Perpetuities; incidents of divid ownership, as waste; natural rights. MTWThF 5:50–7:40 P.M.

201 *Agency* (2)
Master and servant (status of agent), respondeat superior, nature of agency relatio actual authority, parties (disclosed and undisclosed principal), unauthorized trans tions, notice, notification. TF 5:50–8:05 P.M.

219 *Commercial Paper* (4)
Bills of exchange, promissory notes and checks, especially under the Negotiable Ins ments Law. MTWThF 5:50–7:40 P.M.

230 *Conveyances* (2)
Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and user. MTWThF 11:10–12:00 A.M.

240 *Evidence* (4)
Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule. MTWThF 9:10–11:00 A.M. or MTWThF 5:50–7:40 P.M.

251 *Insurance* (2)
The insurance device in life, property, and other risks. MTWThF 9:10–10:00 A.M.

270 *Legislation* (2)
The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation. MTWThF 12:10–1:00 P.M.

279 *Taxation—Federal Income* (4)
Survey of substantive provisions of federal income tax, including concept of gross income, limitations on allowable deductions, problems of capital gains taxation, nontaxable exchanges of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting. MTWThF 5:50–7:40 P.M.

318 *Creditors' Rights* (4)
Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration. MTWThF 5:50–7:40 P.M.

349 *Local Government Law* (2)
The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development. MTWThF 10:10–11:00 A.M.

376 *Restitution* (2)
Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment. MTWThF 7:30–8:20 A.M.

EDUCATION

TWELVE-WEEK SESSION—JUNE 11 TO AUGUST 31

Four Three-week Workshop Courses—Day

109A *Human Development, Learning, and Teaching** (3)
For the general student as well as the prospective teacher. Nature of human growth, development, and learning, illustrated by observation of children in learning situations. June 11 to 29: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

110A *Human Development, Learning, and Teaching** (3)
For the general student as well as the prospective teacher. Nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations. July 2 to 20: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

121A *Society and the School** # (3)
For the general student as well as the prospective teacher. The historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. July 23 to August 10: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

122A *Society and the School** (3)
For the general student as well as the prospective teacher. Organization and operation of schools, principles and functions, role of the teacher. August 13 to 31: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

*, # See footnotes on page 40.

FOUR SIX-WEEK COURSES—EVENING

109B *Human Development, Learning, and Teaching*‖ (3)
For the general student as well as the prospective teacher. Nature of human growth development, and learning, illustrated by observation of children in learning situations. Field work to be arranged. June 11 to July 20: lecture—MW 6:40–9:00 P.M. conference—6:00–6:40 P.M. (days to be arranged).

110B *Human Development, Learning, and Teaching*‖ (3)
For the general student as well as the prospective teacher. Nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations. Field work to be arranged. July 23 to August 31: lecture—MW 6:40–9:00 P.M.; conference—6:00–6:40 P.M. (days to be arranged).

121B *Society and the School*‖ # (3)
For the general student as well as the prospective teacher. The historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. Field work to be arranged. June 11 to July 20: lecture—MW 6:40–9:00 P.M.; conference—6:00–6:40 P.M. (days to be arranged).

122B *Society and the School*‖ (3)
For the general student as well as the prospective teacher. Organization and operation of schools; principles and functions; role of the teacher. Field work to be arranged. July 23 to August 31: lecture—MW 6:40–9:00 P.M.; conference—6:00–6:40 P.M. (days to be arranged).

NINE-WEEK SESSION—JUNE 18 TO AUGUST 17

FIRST BLOCK—JUNE 18 TO JULY 6

112 *Guidance in Elementary Schools** (3)
Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109–10 and 121–22. June 18 to 22: lecture—late afternoon; small group discussions and field work—evening. June 25 to July 6: lecture and conference—morning; small group discussions and field work—afternoon.

117 *Elementary School Science** † (3)
For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109–10 and 121–22 or teaching experience. June 18 to 22: lecture—late afternoon; small group discussions and field work—evening. June 25 to July 6: lecture and conference—morning; small group discussions and field work—afternoon.

219 *Elementary School Classroom Procedures** ‡ (3)
Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences. June 18 to 22: lecture—late afternoon; small group discussions and field work—evening. June 25 to July 6: lecture and conference—morning; small group discussions and field work—afternoon.

245 *School and Community** ‡ § (3)
The school as an important member of a team of social agencies that builds the community. June 18 to 22: lecture—late afternoon; small group discussions and field work—evening. June 25 to July 6: lecture and conference—morning; small group discussions and field work—afternoon.

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* A workshop course requiring the full daytime attention of enrollees. Concurrent registration another course scheduled in morning or afternoon not permitted.
† This course may not be taken by students who have completed or plan to enroll in Education
‡ Prerequisite: adequate professional preparation.
§ This course may not be taken by students who have completed or plan to enroll in Education
‖ Enrollees fully employed may not register for another course.
\# This course may not be taken by students who have completed or plan to enroll in Education

251 *Guidance in Secondary Schools*‡ (3)
Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program. June 18 to 22: lecture and conference—late afternoon; small group discussions and field work—evening. June 25 to July 6: lecture and conference—morning; small group discussions and field work—afternoon.

255 *Secondary Education** ‡ (3)
Current proposals for the improvement of secondary education. June 18 to 22: lecture and conference—late afternoon; small group discussions and field work—evening. June 25 to July 6: lecture and conference—morning; small group discussions and field work—afternoon.

271 *The Teacher and School Administration** ‡ (3)
A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions. June 18 to 22: lecture and conference—late afternoon; small group discussions and field work—evening. June 25 to July 6: lecture and conference—morning; small group discussions and field work—afternoon.

Second Block—July 9 to July 27**

113 *Elementary School Art** (3)
For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, $4.50. Lecture and conference—morning; small group discussions and field work—afternoon.

115 *Teaching of Reading in the Elementary School** † (3)
A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109–10 and 121–22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.

120 *Elementary School Arithmetic** † (3)
For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109–10 and 121–22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.

207 *Curriculum Materials** ‡ (3)
For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations. Lecture and conference—morning; small group discussions and field work—afternoon.

225 *Elementary School Reading** ‡ (3)
Developmental and remedial approaches to reading problems. Demonstrations of diagnostic and corrective techniques used by the classroom teacher and the reading specialist or supervisor. Lecture and conference—morning; small group discussions and field work—afternoon.

243 *Human Relations in the Classroom** ‡ (3)
Principles and practices involved in interpersonal relationships between learner and teacher and among learners. Lecture and conference—morning; small group discussions and field work—afternoon.

256 *Secondary Education** ‡ (3)
Current problems in each of the subject-matter fields. Lecture and conference—morning; small group discussions and field work—afternoon.

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*, †, ‡ See footnotes on page 40.
** Psychology 236 *Seminar: Analysis of the Individual for Purposes of Counseling* (see page 33) will be offered July 9 to 27 as a part of the Second Block of the Nine-week Workshop Session.

THIRD BLOCK—JULY 30 TO AUGUST 17**

114 *Elementary School Music** (3)
For undergraduates in the elementary school curriculum. Materials and methods. Pre requisite: Psychology 1 and 22. Lecture and conference—morning; laboratory an field work—afternoon.

116 *Elementary School Social Studies** † (3)
For teachers. Content, methods, materials, and activities essential in the elementar school curriculum. Prerequisite: Education 109–10 and 121–22 or teaching experienc Lecture and conference—morning; small group discussions and field work—afternoo

128 *Children's Literature** † (3)
For teachers. Exploring and evaluating the newer books for children and the chi dren's classics, understanding the contribution of literature in child development, a preciating children's original expressions. Prerequisite: Psychology 1 and 22. Lectu and conference—morning; small group discussions and field work—afternoon.

231 *Secondary School Classroom Procedures** ‡ (3)
Survey of current classroom practices with particular attention to selected topics suc as teacher-pupil planning, group procedures, pupil security, initiatory and culminatin activities, individual and group evaluation techniques; teaching aids, etc.; review recent literature. Lecture and conference—morning; small group discussions and fie work—afternoon.

241 *Education of the Gifted** ‡ (3)
For the classroom teacher. Nature and discovery of giftedness; provisions for th gifted in regular classes; experimental projects. Lecture and conference—morning small group discussions and field work—afternoon.

278 *School Law*‡ (3)
Sources and scope of school law; legal rights and responsibilities of teachers, pupil and taxpayers. Other legal problems of major interest to the group. Lecture an conference—morning; small group discussions and field work—afternoon.

SIX-WEEK SESSION—JULY 9 TO AUGUST 17

218 *Philosophy of Education*‡ (3)
Social foundations of education—a study of the forces that shape the policies an offerings of the school. MTWThF 8:00–9:00 P.M.; two conference hours to be a ranged.

229 *Administration of Elementary Education*‡ (3)
For experienced teachers and administrators. Administration as a means of achievi instructional objectives, organizing learning and teaching activities, handling supplie and equipment, maintaining the building, and integrating school and community lif Emphasis upon guide lines to action. MTWThF 1:00–2:00 P.M.; two conferen hours to be arranged.

233 *Audio-visual Education*‡ ‖ (3)
Role of audio-visual materials in learning; selection, evaluation, and use of material administrative problems in the care, operation, maintenance, and use of audio-visu materials and equipment. Material fee, $7. MW 6:40–9:00 P.M.; two conferen hours to be arranged.

272 *The Teacher and School Supervision*‡ (3)
Nature, organization, human relationships, and techniques. MTWThF 10:20–11 A.M.; two conference hours to be arranged.

275 *School Finance*‡ ‖ (3)
Educational financial theory, practice, and control, including methods of financi MTWThF 6:40–9:00 P.M.; two conference hours to be arranged.

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*, †, ‡ See footnotes on page 40.
** Psychology 228 *Seminar: Techniques of Counseling* (see pages 32-33) will be offered July 30 to August 17 as a part of the Third Block of the Nine-week Workshop Session.

277 *Administration of School Personnel*‡ ‖ (3)
Techniques and problems of administration related to more effective service of staff personnel. MW 6:40–9:00 P.M.; two conference hours to be arranged.

280 *Adult Education*‡ ‖ (3)
The adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs. TTh 6:40–9:00 P.M.; two conference hours to be arranged.

295A *Educational Research Methods and Procedures* (3)
Required of all Master of Arts candidates following Plan 2. Knowledge of elementary statistics required. MTWThF 9:10–10:10 A.M.; two conference hours to be arranged.

295B *Educational Research Methods and Procedures* (3)
Required of all Master of Arts candidates following Plan 2. Knowledge of elementary statistics required. MTWThF 1:00–2:00 P.M.; two conference hours to be arranged.

297 *Reading in Education*
To assist those preparing for the comprehensive examinations. No credit toward degree requirements. MTWThF 4:45–5:45 P.M. Tuition fee, $30.

‖ See footnotes on page 40.

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Columbian College of Arts and Sciences: Associate in Arts (A.A.), Associate in Science (A.S.), Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)

Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

National Law Center:

Law School: Bachelor of Laws (LL.B.)

Graduate School of Public Law: Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)

School of Engineering: Engineering Technologist Certificate (Eng. Tech. Cert.), Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)

School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: Associate in Arts (A.A.), Associate in Science (A.S.), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.).

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

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School of Engineering.....Dean of the School of Engineering
School of Medicine.....Director of Admissions
Summer Sessions.....Dean of the Summer Sessions
Schedule of Classes: Fall and Spring Semesters.....Registrar
Schedule of Classes: Summer Sessions.....Dean of the Summer Sessions

The George Washington University

Bulletin



THE CATALOGUE ISSUE
1962-63

WASHINGTON 6, D. C.
JULY 1962
VOL. LXI No. 14

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated belo
For any information not included here, please write to the Director of Admissio
The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several c
leges and schools will be found in separate issues of the University Bulletin, whi
are listed on the inside back cover.

Admission.....Director of Admissions, Building

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Alumni Association.....Alumni Office, Bacon H

Foreign Students.....Adviser to Foreign Students, Building

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Master's degrees.....Dean of Columbian College of Arts and Scien
Doctor of Philosophy.....Dean of The Graduate Coun

In Education.....Dean of The School of Educati

In Engineering.....Committee on Graduate Studies, School of Engineer

In Law.....Dean of The Graduate School of Public L

In Accounting, Business Administration, Business and Economic Statistics
Economic Policy, Hospital Administration, International Affairs, Personne
Administration, Public Administration, and Public Affairs.....Dean of
School of Government, Business, and International Affa

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Women.....Director of Women's Activities, Woodhull Ho

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Veterans Education.....Director of Veterans Education, Buildin

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Bulletin

THE CATALOGUE ISSUE
1962-63

VOLUME LXI JULY 1962 NUMBER 14

Pa

Botany 1
Business and Public Administration 1
Hospital Administration 1
Chemistry 1
Classical Languages and Literatures 1
Dermatology and Syphilology 1
Economics 1
Education 2
Engineering 2
English 2
Geography 2
Geology 2
Germanic Languages and Literatures 2
History 2
Home Economics 2
Journalism 3
Law 3
Mathematics 3
Medicine 3
Microbiology 3
Neurology and Neurological Surgery 3
Obstetrics and Gynecology 3
Ophthalmology 3
Otolaryngology 3
Pathology 3
Pediatrics 3
Pharmacology 3
Pharmacy 3
Philosophy 3
Physical Education for Men 3
Physical Education for Women 3
Physical Medicine and Rehabilitation 3
Physics 3
Physiology 3
Political Science 3
Psychiatry 3
Psychology 3
Radiology 3
Religion 3
Romance Languages and Literatures 3
Secretarial Studies 3
Slavic Languages and Literatures 3
Sociology and Anthropology 3
Speech 3
Statistics 3
Surgery 3
Urology 3
Zoology 3
INDEX 3

THE UNIVERSITY CALENDAR

1962

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	....	....	....	....

August

....	....	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	....

September

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October

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November

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December

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1963

January

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March

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April

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May

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June

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July

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August

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September

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October

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November

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December

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22	23	24	25	26	27
29	30	31	....	....	....

THE UNIVERSITY CALENDAR*

1962–63

Fall Semester:

Advising: freshmen, sophomores, new students	Sept. 10–19 ..... Mon.–Wed.
School of Engineering placement tests: entering freshmen	Sept. 13 ..... Thurs.
Orientation Assembly: all new students	Sept. 14 ..... Fri.
Curriculum assemblies: new students attend one	Sept. 14 and 17 ..... Fri. and Mon.
Placement tests (other than Engineering)	Sept. 18 ..... Tues.
Qualifying examinations	Sept. 18 ..... Tues.
School of Engineering graduate registration	Sept. 18 and 19† ..... Tues. and Wed.
University Faculty Meeting	Sept. 19 ..... Wed.
Registration‡	Sept. 20–22 ..... Thurs.–Sat.
Classes begin	Sept. 24 ..... Mon.
Subjects of Master's theses of Feb. candidates due in appropriate Dean's Office	Oct. 5 ..... Fri.
S.J.D. dissertations of Feb. candidates due	Oct. 5 ..... Fri.
Board of Trustees Meeting	Oct. 11 ..... Thurs.
Application for Feb. graduation due in Registrar's Office	Oct. 31 ..... Wed.
Veterans Day. Holiday	Nov. 12 ..... Mon.
Thanksgiving recess	Nov. 22–24 ..... Thurs.–Sat.
Ph.D. and D.B.A. dissertations of Feb. candidates due in appropriate Dean's Office	Nov. 30 ..... Fri.
Graduate Record Examination	Dec. 3 ..... Sat.
Board of Trustees Meeting	Dec. 13 ..... Thurs.
Christmas recess	Dec. 22–Jan. 2 ..... Sat.–Wed.
Classes resume	Jan. 3 ..... Thurs.
Master's theses of Feb. candidates due in appropriate Dean's Office	Jan. 3 ..... Thurs.
D.Sc. and Ed.D. dissertations of Feb. candidates due in appropriate Dean's Office	Jan. 3 ..... Thurs.
Last day of fall-semester classes	Jan. 16 ..... Wed.
Examination period	Jan. 21–26 ..... Mon.–Sat.
School of Engineering advising: freshmen, sophomores, and all new students	Jan. 21–30 ..... Mon.–Wed.

Spring Semester:

School of Engineering graduate registration	Jan. 29 and 30† ..... Tues. and Wed.
Placement tests	Jan. 30 ..... Wed.
Qualifying examinations	Jan. 30 ..... Wed.

* In the School of Medicine registration is conducted September 13, from 10:00 A.M. to 4:00 P.M.; classes begin September 17. The Calendar of the School of Medicine is published in the schedule of classes for that School.

† From 11:00 A.M. to 8:00 P.M.

‡ September 20 and 21, from 12:00 to 8:00 P.M.; September 22, from 10:00 A.M. to 1:00 P.M.

Registration*	Jan. 31–Feb. 2 ..... Thurs.–Sa
Spring-semester classes begin	Feb. 4 ..... Mo
Board of Trustees Meeting	Feb. 7 ..... Thu
Subjects of Master's theses of June candidates due in appropriate Dean's Office	Feb. 8 ..... F
S.J.D. dissertations of June candidates due	Feb. 8 ..... F
Winter Convocation. Holiday	Feb. 22 ..... F
Application for June graduation due in Registrar's Office	Feb. 28 ..... Thu
Application for 1963–64 fellowships due	March 1 ..... F
Application for 1963–64 Engineering and Law Scholarships due	March 1 ..... F
Board of Trustees Meeting	March 7 ..... Thu
University Faculty Meeting	March 19 ..... Tu
Ph.D., Ed.D., and D.B.A. dissertations of June candidates due in appropriate Dean's Office	March 29 ..... F
Application for 1963–64 scholarships (other than Engineering and Law) due	April 1 ..... M
Graduate Record Examination	April 6 ..... S
Theses and dissertations of June Engineering candidates due in Dean's Office	April 8 ..... M
Easter recess	April 12–17 ..... Fri.–W
Master's theses of June candidates (other than Engineering) due in appropriate Dean's Office	May 1 ..... W
Board of Trustees Annual Meeting	May 9 ..... Thu
Last day of spring-semester classes	May 15 ..... W
Examination period	May 20–25 ..... Mon.–S
Memorial Day. Holiday	May 30 ..... Th
Baccalaureate Service	June 2 ..... S
Commencement	June 5 ..... W
SUMMER SESSION:†	
Registration for eight-week term	June 17 ..... M
Classes begin	June 18 ..... Tu
Independence Day. Holiday	July 4 ..... Th
Eight-week term ends	Aug. 9 ..... F
REGISTRATION FOR FALL SEMESTER 1963–64	Sept. 19–21 ..... Thurs.–S

* January 31 and February 1, from 12:00 to 8:00 P.M.; February 2, from 10:00 A.M. to 1:00 P.M.

† For all schools and colleges offering courses in the Summer Sessions except the Law School and School of Education.

The dates of the Calendar of the Law School will be announced.

The calendar for the special sessions of the School of Education is as follows: Twelve-week Session—June 10 to August 30, registration June 10; Nine-week Session—June 18 to August 16, registration June 17; Six-week Session—July 9 to August 15, registration July 8.

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1963

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Newell Windom Ellison, A.B., LL.B., LL.D.
Alfred Henry Lawson, LL.B., LL.D.
John Keown McKee
Benjamin Mosby McKelway, Litt.D.
James Matlack Mitchell, A.M.
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Lewis L. Strauss, Sc.D., LL.D., L.H.D.

1964

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Edward Karrick Morris, LL.D.
Godfrey Leon Munter, A.B., LL.B., LL.D.
*Frederick A. Reuter, M.D.
*James Cornelius Van Story, A.M.
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* Nominated by the alumni.

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1961–62

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*On sabbatical leave spring semester 1961–62.
† On leave of absence 1961–62.

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1961–62

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1961–62

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1961–62

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FRANK DUANE ALLAN, Ph.D., *Associate Professor of Anatomy*
JOHN GAGE ALLEE, JR., Ph.D., *Associate Professor of English Philology; Associate Dean of the Division of University Students*
MELVIN GUSTAVUS ALPER, A.B., M.D., *Associate in Ophthalmology*
LOUIS KATZ ALPERT, B.S., M.D., *Professor of Medicine*
SEYMOUR ALPERT, A.B., M.D., *Professor of Anesthesiology*
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DAVINDER KUMAR ANAND, B.M.E., M.S. in Eng., *Instructor in Mechanical Engineering*
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TAMIS WILSON BORDEN, A.B., *Administrative Secretary of the University*
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MAXWELL BOVERMAN, A.B., M.D., *Clinical Instructor in Psychiatry*
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ALICE BRIGHAM, A.B., M.D., *Associate in Medicine*
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BERNARD BERYL BRODIE, Ph.D., *Professorial Lecturer in Pharmacology*
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CRAWFORD SOUTHWELL BROWN, A.B., M.D., *Associate in Dermatology and Syphilol*
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THOMAS HAYWARD BROWN, *Associate Professorial Lecturer in Law*
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JOHN ROBERT BUCHHEIT, M.S., *Lecturer in Zoology*
JAMES LEONARD BUCKLER, A.M., *Professorial Lecturer in Accounting*
DEXTER MEANS BULLARD, Ph.B., M.D., *Clinical Professor of Psychiatry*

* On leave of absence 1961–62.
† On leave of absence fall semester 1961–62.

Isabel Blogg Burger, A.B., *Lecturer in Speech*
*Arthur Edward Burns, Ph.D., *Professor of Economics; Dean of the Graduate Council*
James Theodore Burns, M.D., *Associate in Medicine*
Elizabeth Burtner, A.M., *Professor of Physical Education for Women*
Stewart William Bush, B.S., M.D., *Assistant Professor of Medicine*
Cesar Augusto Caceres, B.S., M.D., *Associate in Medicine*
Paul Calabrisi, Ph.D., *Professor of Anatomy*
Willard Edmund Caldwell, Ph.D., *Associate Professor of Psychology*
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John Lansing Cameron, A.M., *Associate Professorial Lecturer in Education*
James Vernon Camp, A.M., *Associate in Physical Education for Men*
John Martin Campbell, A.B., *Assistant Professor of Sociology and Anthropology*
Robert Dale Campbell, Ph.D., *Professor of Geography*
Gerald Vincent Carroll, Ph.D., *Associate Professor of Geology*
Thomas Carroll, B.C.E., *Instructor in Civil Engineering*
Thomas Henry Carroll, B.S., M.B.A., D.C.S., LL.D., *Professor of Economic Development and Administration; President of the University*
Wesley Thomas Carroll, Ph.D., *Professor of Education*
William Robert Carroll, Ph.D., *Professorial Lecturer on Proteins*
George Davis Cary, B.S., LL.B., LL.M., *Lecturer in Law*
Richard Bernard Castell, A.B., M.D., *Associate in Medicine; Director of Health Administration; University Physician*
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Harold William Clark, Jr., Ph.D., *Associate in Biochemistry*
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James Clifford, M.D., *Clinical Instructor in Medicine*
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William Graham Clubb, Ph.D., *Associate Professor of French*
Charles Seymour Coakley, M.D., *Professor of Anesthesiology*
Robert Norwood Coale, B.S., M.D., *Associate in Medicine*
James Harold Coberly, Ph.D., *Professor of American Literature*
George Joel Cohen, M.D., *Clinical Instructor in Pediatrics*
Manuel Frederick Cohen, B.S., LL.B., *Lecturer in Law*
Sheldon Stanley Cohen, A.B., J.D., *Lecturer in Law*

* On sabbatical leave spring semester 1961–62.

Victor Hugo Cohn, Jr., Ph.D., *Assistant Professor of Pharmacology*

Oswald Symister Colclough, B.S., LL.B., LL.D., Sc.D., *Professor of Law; Provost and Dean of Faculties*

Charles William Cole, Ph.D., *Professor of American Literature; Dean of the Summer Sessions*

Allan Bertram Coleman, M.D., *Assistant Clinical Professor of Pediatrics*

Mary Ellen Coleman, A.M., *Associate Professor of Education; Director of the Reading Clinic*

Leonard Cornelius Collins, A.B., LL.M., *Professorial Lecturer in Business Administration*

Gerhard Colm, Dr. rer. pol., *Professorial Lecturer in Economics*

Joseph Geoffrey Colmen, Ph.D., *Associate Professorial Lecturer in Psychology*

Kenneth Seymour Colmen, B.A.E., Ph.D., *Professorial Lecturer in Engineering Administration*

William John Condell, Jr., Ph.D., *Lecturer in Physics*

Joseph Francis Conlon, D.D.S., *Clinical Instructor in Dental Surgery*

Audrey Connor, A.B., M.D., *Clinical Instructor in Medicine*

Charles Barrie Cook, B.S., M.D., *Associate in Pathology*

Charles David Cooper, A.B., M.D., *Associate in Medicine*

Franklin Dero Cooper, M.S., *Associate Professor of Hospital Pharmacy*

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William Hurlburt Cooper, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*

Bernard Robert Cooperman, A.B., M.D., *Clinical Instructor in Medicine*

Ernest Cotlove, B.S. M.D., *Associate in Medicine*

Ronald Atmore Cox, A.B., M.D., *Professor of Ophthalmology; Associate University Physician*

Paul Arthur Crafton, B.M.E., Ph.D., *Professor of Mechanical Engineering*

Louis Aleck Craig, Jr., A.B., M.D., *Associate in Medicine*

Elizabeth Amanda Crisp, B.S., M.D., *Clinical Instructor in Obstetrics and Gynecology*

Jeremiah Keith Cromer, M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*

Robert Emmet Cronin, M.S., *Assistant Professor of Engineering Administration*

Charles Robert Crowe, Ph.D., *Associate Professor of Political Science*

Jack Crowell, B.S., M.D., *Clinical Instructor in Medicine*

Beverly Anderson Crump, B.S., Ed.M., *Associate Professorial Lecturer in Education*

John Culberson, A.B., M.D., *Assistant Professor of Pathology*

Leon Richard Culbertson, B.S., M.D., *Clinical Professor of Urology*

James Albert Cunningham, B.S., *Lecturer in Electrical Engineering*

Harrison Everett Curtis, B.S., M.D., *Instructor in Anesthesiology*

William John Cushing, B.S., M.D., *Instructor in Surgery*

Harold Cushman, A.M., *Lecturer in Education*

Gordon Walford Daisley, Jr., A.B., M.D., *Clinical Instructor in Pediatrics*

Abraham Wolffe Danish, A.B., M.D., *Associate in Medicine*

Dwight David Darland, A.M., Ed.D., *Professorial Lecturer in Education*

David Stanley Davis, A.B., M.D., *Clinical Instructor in Medicine*

John Tait Davis, Ph.D., *Assistant Professor of Geography*

Lee Washington Davis, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*

William Columbus Davis, Ph.D., *Associate Professor of Latin American History*
William Joseph Graham Davis, A.B., M.D., *Associate in Ophthalmology*
Clarke Davison, Ph.D., *Associate Professor of Pharmacology*
James Forrester Davison, A.B., LL.B., LL.M., S.J.D., *Professor of Law*
Roderic Hollett Davison, Ph.D., *Professor of European History*
Robert Day, A.B., M.D., *Associate in Ophthalmology*
Benjamin Franklin Dean, Jr., M.D., M.S., *Assistant Clinical Professor of Surgery; University Surgeon*
Vincent James DeAngelis, B.S. in P.E., A.M. in Ed., *Professor of Physical Education for Men*
Lyle Conway Dearden, Ph.D., *Clinical Instructor in Anatomy*
Robert Lyle Dedrick, M.S.E., *Assistant Professor of Mechanical Engineering*
Stephen William Dejter, A.B., M.D., *Clinical Instructor in Medicine*
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Louis dePian, Ph.D., *Professor of Electrical Engineering*
Alton Harold Desmond, Ph.D., *Associate Professor of Zoology*
Harry Grubb Detwiler, Ed.D., *Associate Professor of Education*
Daniel Deykin, A.B., M.D., *Clinical Instructor in Medicine*
Herbert Harold Diamond, M.D., *Clinical Instructor in Pediatrics*
Friedrich Paul Julius Diecke, Dr. rer. nat., *Associate Professor of Physiology*
Oscar Charles Disler, A.M., *Associate Professorial Lecturer in Accounting*
Robert Galloway Dixon, Jr., Ph.D., LL.B., *Professor of Law*
James Carlton Dockeray, Ph.D., *Professor of Finance*
Samuel Mayer Dodek, A.M., M.D., *Associate Clinical Professor of Obstetrics and Gynecology*
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Orville Wright Donnelly, M.S., M.D., *Clinical Instructor in Medicine*
Hamilton Peacock Dorman, B.S., M.D., *Clinical Instructor in Urology*
Jesse Frank Doubleday, A.M., *Lecturer in Business Administration*
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* On leave of absence 1961–62.

GEORGE THEMISTOCLES ECONOMOS, B.S., M.D., *Clinical Instructor in Medicine*
DAVID EDEN, A.B., M.D., *Assistant Clinical Professor of Psychiatry*
JUSTIN LINCOLN EDGERTON, A.B., LL.B., *Professorial Lecturer in Law*
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WILFRED RUSSELL EHRMANTRAUT, B.S., M.D., *Associate in Medicine*
CHURCHILL EISENHART, Ph.D., *Adjunct Professor of Engineering*
HOWARD EISNER, B.E.E., M.S., *Lecturer in Electrical Engineering*
JOEL ELKES, M.B., Ch.B., M.D., *Clinical Professor of Psychiatry*
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GLORIA DONNA ENG, M.D., *Clinical Instructor in Pediatrics*
WILLIAM FRANCIS ENOS, A.B., M.D., *Assistant Clinical Professor of Pathology*
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LESTER WALTER FIX, M.D., *Associate in Pathology*
MICHAEL FLEISCHER, Ph.D., *Professorial Lecturer in Geology*
MARVIN PEACE FOOTER, A.B., M.D., *Associate in Obstetrics and Gynecology*
CHARLES EUGENE FORSYTHE, M.F.A., *Studio Lecturer in Art (Design)*
CHARLES WILLIAM FOULKE, A.B., M.D., *Clinical Instructor in Medicine*

Richard Crosman Fowler, B.S., M.D., *Assistant Professor of Medicine*
James Harold Fox, A.M., Ed.D., *Professor of Education; Dean of the School of Education*
Mary Alice Vann Fox, A.B., M.D., *Clinical Instructor in Pediatrics*
Raymond Richard Fox, M.S. in C.E., *Associate Professor of Civil Engineering*
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Adolph Friedman, A.B., M.D., *Associate in Medicine*
Irving Friedman, Ph.D., *Lecturer in Geology*
Joseph Marshall Friedman, A.B., M.D., *Clinical Instructor in Obstetrics and Gynecology*
William Thomas Fryer, A.B., LL.B., J.D., *Professor of Law*
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James Leo Gagnier, A.B., LL.M., Major, United States Air Force, *Assistant Professor of Air Science*
Robert Elemer Gajdusek, A.M., *Assistant Professor of English*
Charles Edward Galbreath, Ph.D., *Professor of International Affairs; Director, Off-Campus Center, Army War College, Carlisle, Pennsylvania*
Michael Graham Gallagher, A.B., *Instructor in Accounting*
Patrick Francis Gallagher, A.B., *Assistant Professor of Sociology and Anthropology*
James Quincy Gant, Jr., M.S., M.D., *Assistant Clinical Professor of Dermatology and Syphilology*
Leroy Maxwell Garrell, B.S., Captain, United States Air Force, *Assistant Professor of Air Science*
Harry Irving Gates, M.F.A., *Studio Lecturer in Art (Design)*
Charles Edward Gauss, Mus.B., Ph.D., *Elton Professor of Philosophy*
Erving Francis Geever, M.D., Ph.D., *Associate Clinical Professor of Pathology*
Harold Loran Geisert, Ph.D., *Professor of Sociology and Anthropology*
Seymour Geisser, Ph.D., *Associate Professorial Lecturer in Statistics*
Lyndale Harpster George, B.S. in P.E., A.M. in Ed., A.P.C., *Assistant Professor of Physical Education for Women*
Leon Gerber, M.D., *Clinical Instructor in Surgery*
Lila Ghent, Ph.D., *Assistant Research Professor of Psychology*
John Giancaspro, A.M. in Ed., *Associate Professorial Lecturer in Education*
Frederick Harrell Gibbs, M.H.A., *Professor of Hospital Administration; Coordinator of the Graduate Program in Hospital Administration*
Sam Thompson Gibson, B.S., M.D., *Associate in Medicine*
Leon Gintzig, Ph.D., *Associate Professor of Hospital Administration*
Eugene Solomon Gladsden, B.S., M.D., *Assistant Clinical Professor of Medicine*
Ezra Glaser, A.M., *Professorial Lecturer in Engineering Administration*
William Bainbridge Glew, M.D., M.S., *Clinical Instructor in Ophthalmology*
Morton Gluck, A.B., M.D., *Clinical Instructor in Medicine*
Ira David Godwin, B.S., M.D., *Clinical Instructor in Pathology*

HERBERT ABRAHAM GOLDBERG, M.B., Ch.B., *Clinical Instructor in Urology*
SEYMOUR ZONALD GOLDBLATT, B.S., M.D., *Clinical Instructor in Pediatrics*
GEORGE JOSEPH GOLDSBOROUGH, B.S., J.D., *Associate Professorial Lecturer in Law*
EDWARD GOLDSTEIN, A.M., *Lecturer in Education*
THOMAS ALPHONSE GONDER, B.S., M.D., *Assistant Clinical Professor of Medicine*
REUBEN GOODMAN, M.D., *Associate in Dermatology and Syphilology*
JACQUELINE JARRETT GOODNOW, Ph.D., *Assistant Research Professor of Psychology*
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ROBERT SIRKOSKY GORDON, JR., A.B., M.D., *Clinical Instructor in Medicine*
SAMUEL CHRABOLOWSKI GORDON, M.D., *Associate in Psychiatry*
CONRAD GOSSELS, M.D., *Associate in Medicine*
RAYMOND GEORGES GOTTSCHALK, B.S., M.D., *Associate Clinical Professor of Pathology*
ERNEST ALVA GOULD, B.S., M.D., *Clinical Instructor in Surgery*
MURRAY GRANT, M.D., D.P.H., *Clinical Professor of Community Health*
IRVING GRAY, Ph.D., *Professorial Lecturer on Isotopes*
PAUL HOLLEY GRAY, B.S., M.D., *Assistant Clinical Professor of Psychiatry*
WOOD GRAY, Ph.D., *Professor of American History*
DAVID CRITTENDON GREEN, A.B., LL.B., *Associate Professor of Law*
HAROLD PAUL GREEN, A.B., J.D., *Lecturer in Law*
ROBERT MILTON GREENBERG, A.B., M.D., *Assistant Clinical Professor of Psychiatry*
SAMUEL GREENHOUSE, Ph.D., *Professorial Lecturer in Statistics*
ANGUS MACIVOR GRIFFIN, Ph.D., *Professor of Microbiology; Associate Dean of the School of Medicine*
ROBERT EDMUND GRIFFITHS, A.B., M.H.A., *Assistant Professor of Hospital Administration*
NELSON THOMAS GRISAMORE, Ph.D., *Professor of Electrical Engineering*
ROBERT HENRY GROH, B.S., M.D., *Associate Clinical Professor of Neurology*
FREDERICK MOULTON GROSS, M.D., *Associate in Medicine*
MABEL HARLAKENDEN GROSVENOR, M.D., *Assistant Clinical Professor of Pediatrics*
CHARLES GRUENWALD, A.B., M.D., *Clinical Instructor in Anesthesiology*
LESLIE ARNOLD GUILDNER, Ph.D., *Adjunct Professor of Engineering*
MILTON GUSACK, A.B., M.D., *Assistant Clinical Professor of Medicine*
MILTON GUSSOW, B.S. in E.E., M.S., *Lecturer in Electrical Engineering*
MARGARET FRANCES GUTELIUS, A.B., M.D., *Assistant Clinical Professor of Pediatrics*
EDWARD HACSKAYLO, Ph.D., *Associate Professorial Lecturer on Plant Physiology*
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RAYMOND GEORGE HANKEN, B.S. in P.E., A.M. in Ed., *Professor of Physical Education for Men*
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JEROME BLAINE HARRELL, M.D., *Assistant Clinical Professor of Surgery; Associate University Surgeon*

David Warner Harris, A.B., M.D., *Clinical Instructor in Psychiatry*
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John May Harrison, M.S., *Lecturer in Physics*
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Thomas Lees Hartman, A.M., M.D., *Associate in Medicine*
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George Francis Henigan, Jr., Ph.M., *Professor of Speech*
Charles Herber, A.M., *Assistant Professor of European History*
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Henry William Herzog, B.S., *Treasurer of the University*
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George Alfred Higgins, Jr., B.S., M.D., *Clinical Professor of Surgery*
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Charles Wadsworth Hill, Ph.D., *Associate Professor of Psychology*
Elizabeth Harman Hill, M.D., *Assistant Clinical Professor of Medicine*
Peter Proal Hill, A.M., *Instructor in History*
Kenneth Hine, *Studio Lecturer in Art (Commercial Art)*
John Vincent Hinkel, M.S., *Lecturer in Journalism*
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Cornelia Hoch-Ligeti, M.D., *Assistant Clinical Professor of Pathology*
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James Pippert Hollinger, Ph.D., *Assistant Professor of Physics*
Ariel Cahill Hollinshead, Ph.D., *Assistant Research Professor of Medicine (Pharmacology)*
Pearl Holly, M.S., M.D., *Associate Clinical Professor of Medicine*
Alec Horwitz, M.S., M.D., *Clinical Professor of Surgery*
David Horwitz, M.D., *Assistant Clinical Professor of Medicine*
Norman Harold Horwitz, A.B., M.D., *Clinical Instructor in Neurological Surgery*
Nicholas Hotton, Ph.D., *Professorial Lecturer in Geology*
Hugh Osgood House, A.B., M.D., *Associate University Physician*
Frederick Russell Houser, A.M. in Govt., *Registrar; Secretary of the Faculties*
Charles Edwin Houston, Ph.D., *Professorial Lecturer in Business Administration*
Robert Lynwood Howard, A.B., M.D., *Clinical Instructor in Medicine*

WILLIAM ALLEN HOWARD, A.B., M.D., *Clinical Professor of Pediatrics*
JOHN STEWART HOWE, A.B., M.D., *Associate Clinical Professor of Pathology*
JOHN DECATOR HOYLE, B.S., M.D., *Clinical Instructor in Surgery*
CHING-YAO HSIEH, A.M., *Instructor in Economics*
HENRY FURNESS HUBBARD, Ph.D., *Professorial Lecturer in Psychology*
KENNETH ANDREW HUBEL, A.B., M.D., *Associate in Physiology*
RUDOLPH HUGH, Ph.D., *Associate Professor of Microbiology*
THELMA HUNT, Ph.D., M.D., *Professor of Psychology*
ARTHUR PROCTOR HUSTEAD, B.S., M.D., *Clinical Instructor in Neurological Surgery*
CLAYTON HUTCHINS, Ph.D., *Professorial Lecturer in Education*
GÉRARD PAUL HUVÉ, *Instructor in French*
GEORGE IDELSON, B.S., *Associate Professorial Lecturer in Business Administration*
ANNE GAYLE INGRAM, A.M., Ed.D., *Assistant Professor of Physical Education for Women*
VINCENT MICHAEL IOVINE, B.S., M.D., *Clinical Professor of Surgery*
NORMAN HARRY ISAACSON, A.B., M.D., *Clinical Instructor in Surgery*
MARGARET IVES, Ph.D., *Professorial Lecturer in Psychology*
CAROLINE JACKSON, A.M., M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
JOHN WINGFIELD JACKSON, B.S., LL.B., *Adjunct Professor of Law*
MARSHALL HANNIS JACOBSON, A.B., M.D., *Assistant Professor of Medicine*
GILBERT CHESTER JACOBUS, B.S. in C.E., M.B.A., LL.B., *Professor of Public Administration*
RUTH ELIZABETH KERR JAKOBY, A.B., M.D., *Clinical Instructor in Neurological Surgery*
*BURNICE HERMAN JARMAN, A.M., Ed.D., Litt.D., *Professor of Education*
WILLIAM DABNEY JARMAN, B.S., M.D., *Associate Clinical Professor of Urology*
HERBERT JEHLE, Dr.Ing., *Professor of Physics*
JOE LEE JESSUP, M.B.A., *Professor of Business Administration*
ARLIN REX JOHNSON, Ph.D., *Professor of Business Administration*
EVA MAYNE JOHNSON, Ph.D., *Associate Professor of Psychology*
EVERETT HERSCHEL JOHNSON, Ph.D., *Professor of Statistics*
HOWARD ODIN JOHNSON, A.M., Ed.D., *Professorial Lecturer in Education*
THOMAS NICK JOHNSON, Ph.D., *Associate Professor of Anatomy*
WARREN CHARLES JOHNSON, B.S., M.D., *Associate in Psychiatry*
WILLIAM DAVID JOHNSON, B.S. in B.A., *Comptroller of the University*
FRANCIS EDGAR JOHNSTON, Ph.D., *Professor of Mathematics*
BEN CALLOWAY JONES, JR., B.S., M.D., *Assistant Clinical Professor of Medicine*
CHARLES WILSON JONES, A.B., M.D., *Assistant Clinical Professor of Medicine*
ROBERT GEAN JONES, B.D., Ph.D., *Associate Professor of Religion*
ROBERT SMITH JORDAN, Ph.D., D.Phil., *Associate Professor of International Affairs*
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PAULA REINES KAISER, M.B., Ch.B., M.D., *Assistant Professor of Anesthesiology*
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MORTON SELWYN KAUFMAN, A.B., M.D., *Associate in Obstetrics and Gynecology*
SAMUEL KAVRUCK, M.S., A.M. in Govt., Ed.D., *Associate Professorial Lecturer in Education*

* On leave of absence fall semester 1961-62.

John Kaye, M.S. in M.E., *Associate Professor of Engineering Administration*
Robert Kaye, A.M., *Professorial Lecturer in Business Administration*
Elmer Louis Kayser, Ph.D., LL.D., *Professor of European History; Dean of the Division of University Students*
Charles Duell Kean, A.B., S.T.B., D.D., *Associate Professorial Lecturer in Religion*
Charles Keck, A.B., M.D., *Associate in Orthopedic Surgery*
Wilmer Deaver Kehne, A.B., M.D., *Associate in Psychiatry*
Emmett Leroy Kehoe, B.S., M.D., *Assistant Clinical Professor of Medicine*
George Archibald Kelser, Jr., B.S., M.D., *Assistant Professor of Medicine*
John Alexander Kendrick, A.B., LL.B., *Clerk of the Trial Practice Court*
John Whitefield Kendrick, Ph.D., *Professor of Economics*
Marvin Hayne Kendrick, A.B., M.D., *Clinical Instructor in Surgery*
John Kenealy, A.B., M.D., *Clinical Instructor in Urology*
Ralph Dale Kennedy, Ph.D., *Professor of Accounting*
Thomas James Kennedy, Jr., B.S., M.D., *Associate in Medicine*
Hewitt Kenyon, Ph.D., *Assistant Professor of Mathematics*
Irvin Kerlan, B.S., M.D., C.P.H., *Associate in Medicine*
John Mark Keshishian, M.D., *Clinical Instructor in Surgery*
Israel Kessler, M.S., M.D., *Associate in Medicine*
Harry Jay Kicherer, M.D., *Assistant Clinical Professor of Radiology*
Elmer Richard King, A.B., M.D., *Assistant Clinical Professor of Radiology*
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Hayden Kirby-Smith, B.S., M.D., *Assistant Clinical Professor of Dermatology and Syphilology*
Virginia Randolph Kirkbride, A.M., Ed.D., *Associate Professor of Educational Psychology; Director of Activities for Women*
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Stanley William Kirstein, A.B., M.D., *Associate in Medicine*
Jack Kleh, A.B., M.D., *Assistant Clinical Professor of Medicine*
Morris Kleinerman, B.S., M.D., *Associate Clinical Professor of Psychiatry*
Philip Alvin Klieger, M.D., *Assistant Clinical Professor of Physical Medicine and Rehabilitation*
Donald Chenoweth Kline, B.Arch., M.F.A., *Professor of Art*
Calvin Trexler Klopp, A.B., M.D., *Warwick Professor of Surgery (Cancer)*
Alvin Bernt Clifford Knudson, B.S., M.D., *Associate in Physical Medicine and Rehabilitation*
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Charles Joseph Kokoski, Ph.D., *Associate Professor of Pharmacy*
Marvin Curtis Korengold, D.D.S., B.S., M.D., *Clinical Instructor in Neurology*
Gust George Koustenis, B.S. in Phar., M.B.A., *Assistant Professor of Pharmacy Administration*
Norman Clifford Kramer, M.S., M.D., *Instructor in Medicine*
Robert Kramer, A.B., LL.B., *Professor of Law; Dean of the Law School*
Wolfgang Herbert Kraus, Dr. Jur., S.J.D., *Professor of Political Science*
Henry Charles Kreis, A.B., *Lecturer in Speech*
Joseph Leo Krieger, Ph.D., *Professorial Lecturer in Business Administration*

MORRIS EDWARD KRUCOFF, B.S., M.D., *Associate in Otolaryngology*
JOSEPH HENRY KRUPA, M.S., Ed.D., *Professor of Physical Education for Men*
GERSHON KULIN, B.S. in C.E., M.S. in C.E., Sc.D., *Lecturer in Civil Engineering*
SOLOMON KULLBACK, Ph.D., *Professorial Lecturer in Statistics*
MORTON KUPPERMAN, Ph.D., *Associate Professorial Lecturer in Statistics*
*WALTER KURLAND, B.S., M.D., *Clinical Instructor in Medicine*
FREDERICK CHARLES KURTZ, M.B.A., C.P.A., *Associate Professor of Accounting*
ANTHONY CHARLES LABUE, B.S., Ed.D., *Professor of Education; Assistant Dean of the School of Education*
WILLIAM THURSTON LADY, M.D., *Associate in Obstetrics and Gynecology*
RICHARD LAHEY, *Studio Lecturer in Art (Drawing and Painting)*
GERALD SAUL LANDAU, B.S., *Associate in Chemistry*
MANUEL LANDMAN, B.S., M.D., *Clinical Instructor in Dermatology and Syphilology*
HARRY HILL LANDON, JR., Ph.D., *Associate Professorial Lecturer in Physics*
JOHN CARL LANG, A.M., Ed.D., *Associate Professorial Lecturer in Education*
ARTHUR DAVID LARSON, A.M., *Assistant Professor of Public Administration*
JOHN FRANCIS LATIMER, Ph.D., *Professor of Classical Languages and Literatures; Associate Dean of Faculties; University Marshal*
JOHN WILMER LATIMER, JR., M.D., *Assistant Clinical Professor of Medicine*
HENRY PRATHER LAUGHLIN, B.S., M.D., *Associate Clinical Professor of Psychiatry*
CHARLES EDWARD LAW, M.D., *Associate in Medicine*
HELEN BENNETT LAWRENCE, A.M., *Professor of Physical Education for Women*
ESTHER LAWTON, A.M., *Lecturer in French*
ALBERT LAZURE, A.B., LL.B., *Professorial Lecturer in Business Administration*
ARNOLD ALBERT LEAR, M.D., *Clinical Instructor in Medicine*
HUGH LINUS LEBLANC, Ph.D., *Associate Professor of Political Science*
GUST ANGELO LEDAKIS, B.B.A., LL.B., S.J.D., *Associate Professor of Law*
CHESTER ELWOOD LEESE, Ph.D., *Fry Professor of Physiology*
LUBIN POE LEGGETTE, A.M., Ed.D., *Depew Professor of Speech*
WOLFRAM KARL LEGNER, Ph.D., *Professor of German*
HAROLD BERNARD LEHRMAN, A.B., M.D., *Associate in Psychiatry*
SANFORD LEON LEIKIN, M.D., *Associate in Pediatrics*
LAURENCE PEREIRA LEITE, A.M., *Associate Professor of Art*
EDWARD JOSEPH LEONARD, M.D., *Clinical Instructor in Medicine*
ROBERT MEYER LEONARD, Ph.D., *Professor of Pharmacology and Pharmacognosy; Assistant Dean of the School of Pharmacy*
THOMAS MILES LEONARD, Ph.B., M.D., *Assistant Clinical Professor of Obstetrics and Gynecology*
GORDON SPARKS LETTERMAN, B.S., M.D., *Clinical Professor of Surgery*
ARTHUR JEROME LEVENS, B.S., M.D., *Associate in Neurology*
SIDNEY LEVIN, M.S., M.D., *Clinical Instructor in Pediatrics*
JACK LOUIS LEVINE, M.D., *Assistant Clinical Professor of Otolaryngology*
EDWIN LEWIS, M.B.A., *Professor of Accounting*
WILLIAM LEWIS, M.D., *Clinical Instructor in Medicine*
HERBERT JOSEPH LIEBESNY, J.D., *Associate Professorial Lecturer in Law*
BEN AKSEL LINDBERG, B.M.E., M.E., *Professor of Engineering Administration*
CLYDE JOE LINDLEY, A.M., *Lecturer in Psychology*
CALVIN DARLINGTON LINTON, Ph.D., *Professor of English Literature; Dean of Columbian College of Arts and Sciences*

* On military leave 1961-62.

Gordon Leslie Lippitt, B.D., Ph.D., *Professor of Behavioral Sciences*
Leon McNeeley Liverett, B.S., M.D., *Clinical Instructor in Obstetrics and Gynecology*
Thomas Phillip George Liverman, Ph.D., *Professor of Mathematics*
George Adelbert Livingston, Ph.D., *Lecturer in Botany*
Eulogia Llansa, Lic. en Der. Dipl., LL.D., Ph.D., *Instructor in Spanish*
Jean Douglas Lockhart, A.B., M.D., *Clinical Instructor in Pediatrics*
John Hayes Lodge, A.B., M.D., *Clinical Instructor in Ophthalmology*
Edwin Marion Logan, A.M., Ed.D., *Lecturer in Education*
James Walling Long, M.D., *Associate in Medicine*
John Thomas Lord, A.B., M.D., C.M., *Clinical Instructor in Neurological Surgery*
Samuel Dennis Loube, A.B., M.D., *Associate in Medicine*
Reginald Spencer Lourie, B.S., M.D., Med. Sc.D., *Associate Clinical Professor of Pediatric Psychiatry*
Carlos Lozano, A.B., *Assistant Professor of Romance Languages*
Howard Rowland Ludden, A.M., *Associate Professor of Political Science*
Victor Frederick Ludewig, B.S., *Administrator of the University Hospital*
Florence Mary Lumsden, A.M., Ed.D., *Professorial Lecturer in Education*
Melvin Ernest Lyon, Ph.D., *Assistant Professor of American Literature*
Cunningham Ramsey MacCordy, M.D., *Associate Professor of Anesthesiology*
Gordon Rhodes MacDonald, B.S., M.D., *Associate in Urology*
William Allan MacDonald, Ph.D., *Professor of Art and Archaeology*
Thayer Mills Mackenzie, B.S., M.D., *Clinical Instructor in Psychiatry*
Archibald Rich MacPherson, A.B., M.D., *Associate in Pediatrics*
Eleanor Lewis Makel, B.S., M.D., *Associate in Medicine*
George Maksim, M.D., M.S. in Ped., *Assistant Clinical Professor of Pediatrics*
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Benjamin Manchester, M.D., *Assistant Clinical Professor of Medicine*
Harold George Mandel, Ph.D., *Professor of Pharmacology*
James Charles Mandes, A.B., M.D., *Clinical Instructor in Medicine*
Richard Frank Manegold, M.D., *Assistant Clinical Professor of Medicine*
James Packard Mann, M.D., *Associate in Medicine*
John Bayne Marbury, M.D., *Associate in Medicine*
Anthony Marinaccio, Ph.D., *Professorial Lecturer in Education*
William Henry Marlow, Ph.D., *Professorial Lecturer in Mathematics*
Cosimo Ajmone Marsan, M.D., *Associate in Neurology*
William Laverne Marsh, B.S., M.D., *Associate Professor of Pathology*
Robert Edward Martin, M.D., *Assistant Clinical Professor of Pediatrics*
Shirley Sue Martin, A.B., M.D., *Associate in Obstetrics and Gynecology*
John Russell Mason, A.M., M.S. in L.S., *Librarian; Curator of Art*
Martin Alexander Mason, B.S. in Eng., Ing.-Dr., *Professor of Civil Engineering; Dean of the School of Engineering*
Rashid Massumi, M.D., *Assistant Clinical Professor of Medicine*
Louis Harkey Mayo, B.S., LL.B., J.S.D., *Professor of Law; Dean of the Graduate School of Public Law*
Paul Mazel, Ph.D., *Assistant Professor of Pharmacology*
Guido Ettore Mazzeo, Ph.D., *Associate Professor of Romance Languages*
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Margret Katherina McCabe, M.D., *Clinical Instructor in Medicine*
Dennis Parfrement McCarty, M.D., *Clinical Instructor in Surgery*
William Andrew McCauley, Ph.D., *Associate Professor of Education*
Muriel Hope McClanahan, Ph.D., *Associate Professor of English Composition*
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Edward McCrensky, Ed.M., *Professorial Lecturer in Public Administration*
William Stanley McCune, A.B., M.D., *Clinical Professor of Surgery*
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Angus Winston McLaurin, Ph.D., M.D., *Clinical Instructor in Medicine*
Robert Edwin McNalley, S.J., Ph.D., *Professorial Lecturer in Religion*
Alvin Greene McNish, M.S., *Adjunct Professor of Engineering*
Margaret Willcox McPherson, Ph.D., *Associate Professorial Lecturer in Chemistry*
George Elbert McSpadden, Ph.D., *Professor of Romance Languages*
John William McTigue, A.B., M.D., *Clinical Instructor in Ophthalmology*
Floyd Kendrel McTyier, M.C.S., *Associate Professorial Lecturer in Hospital Administration*
Claude Yves Meade, Ph.D., *Associate Professor of Romance Languages*
Florence Marie Mears, Ph.D., *Professor of Mathematics*
Vadim Medish, A.M., *Lecturer in Russian*
William Carey Meloy, M.D., M.S. in Med., *Associate in Surgery*
Arnold Charles Meltzer, B.S.E., M.S. in Eng., *Instructor in Electrical Engineering*
Robert Allen Mendelsohn, M.D., *Clinical Instructor in Neurological Surgery*
Jean Hugues Menetrez, A.B., M.D., *Clinical Instructor in Psychiatry*
Maurice Mensh, M.D., *Assistant Clinical Professor of Medicine*
Leroy Sorenson Merrifield, A.B., LL.B., M.P.A., S.J.D., *Professor of Law*
Howard Maxwell Merriman, Ph.D., *Professor of American Diplomatic History*
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Joseph Louis Metivier, Jr., A.M., *Assistant Professor of Romance Languages*
Herman Arnold Meyersburg, B.S., M.D., *Associate in Psychiatry*
Hilary Ethel Clara Millar, L.R.C.P., S.E., M.P.H., *Clinical Instructor in Pediatric Psychiatry*
Arthur Selwyn Miller, A.B., LL.B., J.S.D., *Professor of Law*
Frank Nelson Miller, Jr., B.S., M.D., *Associate Professor of Pathology*
Ralph Bretney Miller, A.B., M.D., *Associate in Medicine*
Jere Holloway Mitchell, B.S., M.D., *Associate in Physiology*
Reginald Henry Mitchell, M.D., *Clinical Instructor in Pediatrics*
Albert Jay Modlin, M.S., M.D., *Clinical Instructor in Pediatrics*
George Edward Monk, A.B., LL.B., LL.M., *Professorial Lecturer in Law*
Margaret Wheeler Montzka, A.M., *Assistant Professor of Physics*
Robert Hamilton Moore, Ph.D., *Professor of English Composition*

ROBERT MILTON MOORE, B.S.E., *Instructor in Mechanical Engineering*
PHILIP SIDNEY MORGAN, JR., B.S., M.S. in M.E., *Lecturer in Mechanical Engineering*
MABEL ELIZABETH MORRIS, A.M., *Lecturer in Mathematics*
WILLIAM ROSS MORRIS, M.D., *Associate in Surgery*
WILLIAM FITZGERALD MORRISSEY, A.B., M.D., *Instructor in Medicine*
JOHN ANTHONY MORROW, A.M., *Associate Professorial Lecturer in Business Administration*
EDITH ELIZABETH MORTENSEN, Ph.D., *Professor of Zoology*
JAMES NORMAN MOSÉL, A.M., *Associate Professor of Psychology*
HERBERT ALAN MOSKOVITZ, B.S., M.D., *Clinical Instructor in Medicine*
HOWARD OTIS MOTT, A.B., M.D., *Associate in Medicine*
STEPHEN MOURAT, A.B., M.D., *Clinical Instructor in Pediatric Psychiatry*
GEORGE HAMILTON MOWBRAY, Ph.D., *Professorial Lecturer in Psychology*
SAM CLARK MUNSON, Ph.D., *Professor of Biology*
ALBERT CHRISTIAN MURDAUGH, B.S., M.S. in Met.E., *Associate Professor of Mechanical Engineering*
BERNARD WILLIAM MURPHY, M.B., Ch.B., *Clinical Instructor in Psychiatry*
CORNELIUS FRANCIS MURPHY, B.S., M.D., *Instructor in Radiology*
JAMES PETER MURPHY, B.S., M.D., *Assistant Clinical Professor of Neurological Surgery*
JOSEPH PATRICK MURPHY, A.B., LL.B., LL.M., *Professorial Lecturer in Business Administration*
FRANCIS JAMES MURRAY, B.S., M.D., *Assistant Clinical Professor of Medicine*
GEORGE CLOYD MURRAY, B.S., *Assistant Research Professor of Physics*
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NTINOS MYRIANTHOPOULOS, Ph.D., *Clinical Instructor in Neurology*
CHARLES RUDOLPH NAESER, Ph.D., *Professor of Chemistry*
RALPH CLARKE NASH, JR., A.B., J.D., *Associate Professor of Law; Director of the Government Contracts Programs*
JOHN PETER NASOU, A.B., M.D., *Assistant Clinical Professor of Medicine*
ANTHONY NASSNER, Technical Sergeant, United States Air Force, *Instructor in Air Science*
BERTLE NELSON, A.B., M.D., *Associate in Medicine*
NELS DAVID NELSON, Ph.D., *Professor of Mathematics*
PHILLIP GILLARD NELSON, M.D., Ph.D., *Associate in Physiology*
ULIUS SALEM NEVIASER, A.B., M.D., *Assistant Clinical Professor of Orthopedic Surgery*
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LIZABETH SUTHERLAND NEYMAN, A.M., *Instructor in Spanish*
MARGARET MARY NICHOLSON, A.B., M.D., *Clinical Professor of Pediatrics*
NDREW ANTHONY NILLES, A.B., LL.B., *Lecturer in Speech*
ENJAMIN NIMER, Ph.D., *Associate Professor of Political Science*
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* On leave of absence 1961–62.

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ROSCOE BRADY, JR., M.D., *Chief, Section on Lipid Chemistry, Laboratory of Neurochemistry, National Institute of Neurological Diseases and Blindness*; Complex Lipids
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ARTHUR BROWN, Ph.D., *Chief, Branch II, Virus and Rickettsia Division, Fort Detrick;* Virology

DEAN BURK, Ph.D., *Head, Cytochemistry Unit, National Cancer Institute;* Tissue Respiration in Biochemistry

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WILLIAM ROBERT CARROLL, Ph.D., *Biochemist, Laboratory of Physical Biology, National Institute of Arthritis and Metabolic Diseases;* Chemistry and Metabolism of Proteins

HENRY MARCELLUS CATHEY, Ph.D., *Horticulturist, Plant Industry Station, Department of Agriculture;* Plant Physiology; Vascular Plants

CHARLES L. CHRIST, Ph.D., *Physicist, Solid State Group, Geochemistry and Petrology Branch, United States Geological Survey;* Geochemistry

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JAMES GILLETTE, Ph.D., *Head, Section on Enzyme Drug Interaction, Laboratory of Chemical Pharmacology, National Heart Institute;* Drug Metabolism

ABRAHAM GOLDIN, Ph.D., *Head, Biochemical Pharmacology Section, Laboratory of Chemical Pharmacology, National Cancer Institute;* Chemotherapy

NORWOOD BABCOCK GOVE, Ph.D., *Nuclear Data Group, National Academy of Science;* Low Energy Nuclear Physics

ROBERT LORIMER GRANT, Ph.D., *Chief, Insulin Branch, Division of Pharmacology, United States Food and Drug Administration;* Metabolic Relationships of Insulin

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HENRY FIELD HAVILAND, JR., Ph.D., *Senior Staff Member, Brookings Institution;* International Relations, especially American Foreign Policy

ROY HERTZ, Ph.D., M.D., *Chief, Endocrinology Branch, National Cancer Institute;* Endocrinology

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LEON JACOBS, Ph.D., *Chief, Laboratory of Parasitic Diseases, National Institutes of Health;* Medical Parasitology

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SOLOMON KULLBACK, Ph.D., *Chief, Research and Development Division, United States Department of Defense;* Statistics: Multivariate Analysis

BERT NICHOLS LA DU, JR., M.D., Ph.D., *Senior Surgeon, United States Public Health Service, National Institute of Arthritis and Metabolic Diseases;* Amino Acid Metabolism

HOWARD MAER LENHOFF, Ph.D., *Acting Chief, Biochemistry Section, Armed Forces Institute of Pathology;* Protein Biosynthesis

LADISLAUS LASZLO MARTON, Ph.D., *Physicist, Atomic Physics, Electronics Division, National Bureau of Standards;* Electron Optics

MARGARET MERCER, Ph.D., *Director of Research, Department of Psychology, St. Elizabeths Hospital;* Abnormal Psychology

WINFRED OVERHOLSER, A.B., M.D., Sc.D., L.H.D., LL.D., *Professor Emeritus of Psychiatry;* Psychiatry: Problems of Treatment

JACQUES JACOBUS POLAK, Ph.D., *Deputy Director, Research Department, International Monetary Fund;* International Finance

MERLE IRVING PROTZMAN, Ph.D., *Professor Emeritus of Romance Languages;* Seventeenth Century French Literature

JOSEPH HYRAM ROE, Ph.D., *Professor Emeritus of Biochemistry;* Carbohydrate Metabolism; Nutrition (emphasis on vitamins); Pathological Chemistry

LEONARD PETER SCHULTZ, Ph.D., *Curator of Fishes, United States National Museum;* Vertebrate Zoology; Ichthyology

WALTER ALLEN SHROPSHIRE, JR., Ph.D., *Biophysicist, Division of Radiation and Organisms, Smithsonian Institution;* Photobiology

ROBERT SUMNER SIGAFOOS, Ph.D., *Botanist, United States Geological Survey;* Plant Ecology

LYMAN BRADFORD SMITH, Ph.D., *Curator, Division of Phanerogams, Department of Botany, Smithsonian Institution;* Taxonomy

DEWITT STETTEN, JR., M.D., Ph.D., *Associate Director in Charge of Research; Chief, Section on Intermediary Metabolism, National Institute of Arthritis and Metabolic Diseases;* Carbohydrate Metabolism

THOMAS DALE STEWART, A.B., M.D., *Curator, Physical Anthropology, United States National Museum;* Physical Anthropology

MICHAEL JOSEPH SURGALLA, Ph.D., *Chief, Bacteriology I Branch, Medical Bacteriology Division, Fort Detrick;* Immunology

SIDNEY UDENFRIEND, Ph.D., *Chief, Laboratory of Clinical Biochemistry, National Heart Institute;* Amino Acid Metabolism; Neurohormones

LUDWIG VON SALLMANN, M.D., *Chief, Ophthalmology Branch, National Institute of Neurological Diseases and Blindness;* Neuro-ophthalmology

FRANK MARK WEIDA, Ph.D., *Professor Emeritus of Statistics;* Theoretical Statistics: Probability and Sampling; Applied Statistics: Econometrics

GEORGE GREEN WRIGHT, Ph.D., *Chief, Immunology Branch, Fort Detrick;* Immunology

RALPH AUBREY YOUNG, Ph.D., *Director, Division of Research and Statistics, Board of Governors, Federal Reserve System;* International Finance

MEDICINE

LOUIS SOL BARON, Ph.D., *Chief, Department of Bacterial Immunology, Division of Immunology, Walter Reed Army Institute of Research;* Microbial Genetics

ROBERT WILLIAM BERLINER, B.S., M.D., *Chief, Section on Kidney and Electrolyte Metabolism, National Heart Institute;* Renal Disease

BARUCH SAMUEL BLUMBERG, M.D., Ph.D., *Chief, Geographic Medicine and Genetics Section, Epidemiology and Biometry Branch, NIAMD, National Institutes of Health;* Anatomy

JACK HAROLD UPTON BROWN, Ph.D., *Executive Secretary, Physiology Study Section, Division of General Medical Sciences, National Institutes of Health;* Physiology

PETER DIACOUMIS COMANDURAS, B.S., M.D., M.S. in Med., *Secretary General, Medical International Cooperation;* Gastroenterology

ROBERT CARTER COOK, *Director, Population Reference Bureau; Editor, Journal of Heredity;* Medical Genetics

WILLIAM HOLMES CROSBY, A.B., M.D., *Chief of Hematology, Walter Reed Army Institute of Research;* Hematology

CHESTER WILSON EMMONS, Ph.D., *Chief, Medical Mycology Unit, Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases;* Medical Mycology

ROBERT HANNA FELIX, M.D., M.P.H., *Director, National Institute of Mental Health;* Psychiatry

DONALD SHARP FREDRICKSON, B.S., M.D., *Clinical Researcher, Laboratory of Cellular Physiology and Metabolism, National Heart Institute;* Internal Medicine

JAMES LEE GODDARD, M.D., M.P.H., *Civil Air Surgeon, Federal Aviation Administration;* Aviation Medicine

FRANCIS BYRON GORDON, Ph.D., M.D., *Head, Virology Division, Naval Medical Research Institute;* Virology

ELSON BOWMAN HELWIG, B.S., M.D., *Chief, Pathology Division, Armed Forces Institute of Pathology;* Pathology

ROY HERTZ, Ph.D., M.D., *Chief, Endocrinology Branch, National Cancer Institute;* Endocrinology

LEON JACOBS, Ph.D., *Chief, Laboratory of Parasitic Diseases, National Institutes of Health;* Medical Parasitology

LENT CLIFTON JOHNSON, B.S., M.D., *Pathologist, Armed Forces Institute of Pathology;* Pathology

SOL KATZ, B.S., M.D., *Chief of Medicine, Mt. Alto Veterans Administration Hospital;* Pulmonary Disease

ALBERT DAVID KISTIN, A.M., M.D., *Chief of Medicine, Beckley Memorial Hospital, Beckley, W. Va.;* Cardiology

MORRIS CECIL LEIKIND, M.S., *Chief, Historical Research Division, Medical Museum, Armed Forces Institute of Pathology;* History of Microbiology

JOHN DUNCAN MACLENNAN, M.B., M.D.; Microbiology

HAROLD JOSEPH MAGNUSON, A.B., M.D., M.P.H., *Chief, Occupational Health Program, Division of Special Health Services, Department of Health, Education and Welfare;* Occupational Health

THOMAS HODGE MCGAVACK, A.B., M.D., *Chief, Intermediate Service, Veterans Administration Center, Martinsburg, W. Va.;* Metabolic Disease

WALTER KENDALL MYERS, B.S., M.D., *Senior Attending Physician, Washington Hospital Center; Consultant in Internal Medicine, Glenn Dale Hospital and Washington Home for Incurables;* Internal Medicine

WALTER LEWIS NALLS, M.D., *Consultant, Veterans Administration Center, Martinsburg, W. Va.;* Pulmonary Disease

WILLIAM JACKSON PEEPLES, B.S., M.D.,M.P.H., *Health Officer, Montgomery County, Md.;* Public Health Practice

GEORGE OTIS PIERCE, M.S., *Assistant Chief, Bureau of Food and Public Health Engineering, D. C. Department of Health;* Public Health Engineering

MATHEW ROSS, B.S., M.D., *Medical Director, American Psychiatric Association;* Psychiatry

STANLEY JAY SARNOFF, A.B., M.D., *Chief, Laboratory of Cardiovascular Physiology, National Heart Institute;* Cardiovascular Physiology

ALBERT SJOERDSMA, Ph.D., M.D., *Chief, Experimental Therapeutics Section, General Medicine and Therapeutics Branch, National Heart Institute;* Internal Medicine

PIERRE TULOU, M.D., *Chief, Pulmonary Laboratory, Veterans Administration Center, Martinsburg, W. Va.;* Pulmonary Function

SIDNEY UDENFRIEND, Ph.D., *Chief, Laboratory of Clinical Biochemistry, National Heart Institute;* Intermediary Metabolism

PHARMACY

WILLIAM SHOULDEN APPLE, Ph.D., *Assistant Secretary, American Pharmaceutical Association;* Pharmaceutical Organizations

GEORGE FRANCIS ARCHAMBAULT, Ph.G., Ph.C., LL.B., Sc.D., *Chief, Pharmacy Branch, Division of Hospitals; Pharmacy Consultant, Office of the Surgeon General, United States Public Health Service;* Hospital Pharmacy

KARL BAMBACH, Ph.D., *Executive Vice-President, Pharmaceutical Manufacturers Association;* Pharmaceutical Industry

WILLIAM PAUL BRIGGS, M.S., Sc.D., LL.D., *Executive Director and Secretary, American Foundation for Pharmaceutical Education;* Pharmacy Training

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EDWARD GEORGE FELDMAN, Ph.D., *Director, Scientific Division, American Pharmaceutical Association;* Drug Standards

DANIEL LEO FINUCANE, B.S., M.D., *Director of Public Health, District of Columbia;* Public Health

LOUIS EDWARD KAZIN, Phar.G., *Associate Editor, Drug Topics;* Contemporary Pharmacy

HENRY MILLER, LL.B., *Assistant to the General Consul, Federal Trade Commission;* Drug Trade Regulations

MORRIS LOUIS YAKOWITZ, B.S., *Assistant to Director, Division of Administrative Review, Bureau of Enforcement, Food and Drug Administration;* Drug Control

ASSISTANTS

ASSISTANTS IN RESEARCH AND INSTRUCTION

KRISTOFF ABRAHAM, M.D., *Fellow in Neuropathology*

ELAINE COHEN ABRAMSON, A.B., *Graduate Teaching Assistant in Speech*

DAVID LYNDLE AMES, A.B., *Graduate Teaching Assistant in Geography*

NICHOLAS RALPH ANZELMI, B.S. in P.E., *Graduate Teaching Assistant in Physical Education*

MERLE DAVID BAUMGART, A.M., *Graduate Teaching Assistant in History*

SIDNEY RODERICK BLAND, A.M., *University Teaching Fellow in English*

CONCORDIA BORJA, M.S., *Sanders Fellow in Biochemistry*

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PIERRE JEAN CARPENTIER, M.D., *Fellow in Medicine (Gastroenterology)*

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Hugh Pettigrew, B.S., *Graduate Teaching Assistant in Statistics*

Alan Lee Pinkerson, A.B., M.D., *Fellow in Medicine (Cardiovascular Disease)*
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Michael Anthony Eufemio, A.B., M.D., *Assistant in Medicine*
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Rusi Ardeshir Hilloowala, B.D.S., *Assistant in Anesthesiology*
Cher Young Hsu, A.B., M.D., *Assistant in Anesthesiology*
Albert Bernard Iben, M.D., *Assistant in Surgery*
Kyoko Ishiyama Ikari, B.S., R.P.T., *Assistant in Physical Medicine*
George Gordon Kay, A.B., M.D., *Assistant in Medicine*
James Furman Kemp, A.B., M.D., *Assistant in Surgery*
Tetsuji Kiba, M.D., *Assistant in Anesthesiology*
Chong Jae Kim, M.D., *Assistant in Radiology*
Stanley Martin Kirson, A.B., M.D., *Assistant in Surgery*
Edward Ronald Kolvereid, B.S., M.D., *Assistant in Obstetrics and Gynecology*
Constance Krolczyk Lapointe, A.B., M.D., *Assistant in Medicine*
German Lasala, B.S., M.D., *Assistant in Pathology*
Gonzalo Lo, M.D., *Assistant in Medicine*
Everett Winslow Lovrien, A.B., M.D., *Assistant in Pediatrics*
Herbert Lubowitz, A.B., M.D., *Assistant in Medicine*
John Romney Marshall, M.D., *Assistant in Obstetrics and Gynecology*
Richard Bartlett Merlo, A.M., M.D., *Assistant in Radiology*
Frederick Meyers, B.S., M.D., *Assistant in Medicine*
Hugh Miller, A.B., M.D., *Assistant in Medicine*
Margaret Elizabeth Mones, B.S., M.D., *Assistant in Radiology*
William Fitzgerald Morrissey, A.B., M.D., *Assistant in Medicine*
John Paul Mudry, B.S., M.D., *Assistant in Medicine*
Warren James Nelson, B.S., M.D., *Assistant in Radiology*
Hardin Elling Olson, A.B., M.D., *Assistant in Obstetrics and Gynecology*
Leonard Bolton Outlar, A.B., M.D., *Assistant in Obstetrics and Gynecology*
Geraldine Winnie Paul, A.B., M.D., *Assistant in Obstetrics and Gynecology*
Arthur Peschin, B.S., M.D., *Assistant in Anesthesiology*
William Emanuel Roll, Jr., M.D., *Assistant in Surgery*
Randi Veie Rosvoll, B.S., M.D., *Assistant in Pathology*
Corazon Santiago, M.D., *Assistant in Anesthesiology*
Henry Schindelar, A.M., M.D., *Assistant in Medicine*
Stanford Joel Silberman, M.D., *Assistant in Surgery*
Carlos Alberto Silva, B.S., M.D., *Assistant in Surgery*
Barbara Solomon, A.M., M.D., *Assistant in Medicine*
Richard Edward Stang, A.B., M.D., *Assistant in Pediatrics*
Larry Stanton, A.B., M.D., *Assistant in Radiology*
Eugene Octave Sykes Stevenson, B.S., M.D., *Assistant in Surgery*
Larry Nissen Sweet, M.D., *Assistant in Radiology*

ALBERTO DE JESUS TABOADA, B.S., M.D., *Assistant in Anesthesiology*
BAHMAN TEIMOURIAN, B.S., M.D., *Assistant in Surgery*
JASPER FRITZ THOMPSON III, A.B., M.D., *Assistant in Surgery*
ABRAHAM HIRSCH TOPCHIK, B.S., M.D., *Assistant in Pediatrics*
JOAN ADELE TURKUS, B.S., M.D., *Assistant in Pathology*
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RESEARCH PROJECTS

BENJAMIN DOUGLASS VAN EVERA, Ph.D., Sc.D., *Dean for Sponsored Research*

The Research Projects listed in this section are special projects which are set up for the specific purpose of attacking in an academic atmosphere problems submitted by the sponsoring agency. Cooperation between these projects and the various departments of instruction is as close as the nature and needs of the projects and departments will permit. The projects are listed in the order in which they were undertaken by the University.

THE ELECTRONICS RESEARCH PROJECT

The Electronics Research Project does work in the general fields of digital computer circuitry and logic, information storage and retrieval, and systems reliability. This project operates under contracts with the Department of Defense and under grants from the National Science Foundation.

NELSON THOMAS GRISAMORE, Ph.D., *Director; Professor of Electrical Engineering*
LOUIS DEPIAN, Ph.D., *Professor of Electrical Engineering*

THE LOGISTICS RESEARCH PROJECT

The purpose of the Logistics Research Project is to study Logistics problems in all their aspects, to develop more efficient and expeditious methods of solving Logistics problems, and the application of computing machine techniques to the solution of these problems. As part of this study a large collection of operating data is being classified and coded for statistical study using modern machine methods. This project is operated under a contract with the Department of the Navy.

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THE HUMAN RESOURCES RESEARCH OFFICE

The Human Resources Research Office was established by means of a contract between the Department of the Army and The George Washington University to carry out an integrated Army program of human resources research. The work is conducted mainly in the fields of training methods and motivation, morale, and leadership. A research division and supporting services including a statistical office are located on the University campus. Five research units work under the command of Headquarters, Continental Army Command, and the technical supervision of the Washington Office. At present they are situated at Fort Knox, Kentucky; Presidio of Monterey, California; Fort Benning, Georgia; Fort Bliss, Texas; and Fort Rucker, Alabama.

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BIOMETRIC LABORATORY

The Biometric Laboratory applies mathematical techniques to biological problems related to mental health. It was established under a contract with the National Institutes of Health. The laboratory assists investigators throughout the United States in planning research and in analyzing data. The majority of these research projects concern the effects of drugs on behavior.

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THE NASA SPACE FLIGHT TELEMETRY PROJECT

This project involves the reduction and analysis of telemetry data from NASA's sounding rocket program. Machine processing procedures are utilized wherever practical. As part of the analysis phase of this contract, preflight mathematical models are used to simulate the flight and predict the performance and characteristics of the rockets.

THOMAS B. WIGGINS, B.E.E., *Director*

DRIVER BEHAVIOR RESEARCH PROJECT

The Driver Behavior Research Project was established through a grant awarded to the Department of Psychology by the Accident Prevention Division of the Department of Health, Education, and Welfare to develop driver training and rehabilitation procedures for increasing automobile safety. The project is investigating the use of programmed learning, group discussion, and mass communication in driver education.

LAWRENCE E. SCHLESINGER, Ph.D., *Director; Associate Professor of Psychology*
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Elizabeth Brock Larkin, A.B., *Evaluator*
Mary Jane Leuba, A.M., *Statistical Assistant*
Suzanne Johnson Licht, A.B., *Evaluator*
Jean Wilson McGovern, A.M., *Evaluator*
Joyce Ann McNew, *Secretary to the Director*
Diane Claflin Page, *Typist*
Shirley Howerth Richards, A.B., *Evaluator*
Dorothy Tomlin, A.M., *Admissions Adviser*
Cary Williams, *Control Clerk*

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Virginia Schmidt Barnacastle, *Assistant to the Registrar*
Doris Weber Barton, B.S., *Assistant to the Registrar*
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Hunter Duncan Campbell, *Record Clerk*
Catharine Watson Cate, *Balance Sheet Clerk*

Katherine Jane Chan, *Transcript Clerk*
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Bette Inman Davies, *Graduation Clerk*
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Sherry Lee McNamara, *Record Clerk*
Mary Moy Mino, *Statistical Clerk*
Peggy Ann Pillow, *Record Clerk*
Barbara Stewart, *Record Clerk*
Constance Woodward Warner, *Record Clerk*
Joseph Batchelor Watterson, *File Room Supervisor*

THE LIBRARY

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Anna Virginia Appich, A.B., *Assistant Librarian, Acquisitions*
Mary Elizabeth Thompson, B.S., B.S. in L.S., *Assistant Librarian, Cataloguing*
Isabella Frances Young, A.B. in L.S., *Assistant Librarian, Medical Library*
Hugh Yancey Bernard, Jr., A.B., B.S. in L.S., LL.B., *Assistant Librarian Law Library*
Mercy Stoner McCurdy, *Assistant Librarian, Periodicals*
Susan Pierce Murray, Ph.B., B.S. in L.S., *Assistant Librarian, Reference*
Alice Pollock Bray, B.S., B.S. in L.S., *Assistant, Cataloguing*
Margaret Laramy Meaker, A.M., B.S. in L.S., *Assistant, Circulation*
Susan Hi Myong, A.B., M.S. in L.S., *Assistant, Medical Library*
Edith Sewall Phillips, A.B., *Assistant, Cataloguing*
Alice Sheftel, B.S., *Assistant, Acquisitions*
John Kent Minichiello, *Assistant, Circulation*
DeElma Clare Smith, A.B., *Assistant, Reserve Book Reading Room*
Vera Taborsky, A.B., *Assistant, Law Library*
Joan Sweeney Barker, A.B., M.L.S., *Assistant, Cataloguing*
Mona Carol Byrd, A.B., *Assistant, Periodicals*
Betty Mace Hedrick, A.B. in Govt., LL.B., *Assistant, Law Library*
Bruce Stephan Mencher, A.B., J.D., *Assistant, Law Library*
Mary Patterson Howell, *Assistant, Acquisitions*
Evelotte Gertrude Rafferty, *Assistant, Circulation*
Gary William Schenk, *Assistant, Law Library*
Bertha Torquemada, *Assistant, Law Library*
Joan Spofford Hulfish, *Assistant, Cataloguing*
Marie Norton Lynch, *Assistant, Hospital Library*
Alice Daigneau Pentecost, *Assistant, Medical Library*
Charles Edward Wallis, B.S., *Assistant, Circulation*
David Thomas Hulburt, *Assistant, Medical Library*

UNIVERSITY CHAPEL

Dolores Nancy Bedford, A.B., *Assistant to the Director*

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Marvin Topping, A.B., S.T.B., *Assistant Director, University Development Division*
Thomas Michael Ennis, A.B., LL.B., *Alumni Fund Administrator*

Alma Hough Billmyer, *Secretary*
Gloria Whitmer Miller, *Secretary*
June Weber Bray, *Secretary*
Eleanor McPeake Dirks, A.B., *Secretary*
Rose Isabel Curtin, *Alumni Fund Clerk*

Educational Counseling Office

Timothy Edward Smith, A.M., *Educational Counselor*
William Leonard Fournier, A.M., *Educational Counselor*
Victoria Rodriguez, *Assistant*
Dorice Colquitt Fought, *Alumni Representative Assistant*

Public Relations Office

Merle Ellsworth Dowd, A.B., *Director*
Mary Margaret Davis, A.M., *Associate Director*
Lillian Brooks Brown, *Director of Radio and Television*
Richard Church Thompson, *Associate Director of Public Relations for Medicine—Science*
John Samuel Toomey, A.B., *Assistant Director*
Jane Tunstall Lingo, A.B., *Staff Writer*
William Frederick Dismer, Jr., A.B., *Public Relations Assistant in Charge of Sports Publicity*
Doris Drake Wigglesworth, A.M., *Editorial Assistant*
Andrea Rankin Ronhovde, A.B., *Assistant in Radio and Television*
Jessie Collier Ruffner, A.B., *Secretary*

Alumni Office

Stanley Tracy, LL.B., *Alumni Secretary*
Adrienne Barker Kar, *Administrative Assistant*
Dorothy Zelia Brewer, A.M., *Stenographer-Secretary*
Myrtle Virginia Scott, *Record Clerk*
George Schauber, A.B., *File Clerk*
Nicholas Vartzikos, B.S., *Addressograph Operator*
Jay Wellington Smith, *Assistant Addressograph Operator*

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Nelson Mead Head, *Administrative Assistant*
Susan Finnell Hart, *Assistant to the Dean*
William Eugene Smallwood, B.S., *Assistant to the Dean*
Donna Ann Melker, *Secretary*

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Louis James Harris, A.B., LL.B., S.J.D., LL.M., *Executive Director*
Clarke Loomis Herbert, A.B., *Editorial Assistant*
Leona Louise Beeker, A.B., *Assistant Secretary*
Shelagh Foreman Wolfe, B.S., *Assistant Secretary*

STUDENT ACTIVITIES

Paul Vernon Bissell, Ph.D., *Associate Director of Activities for Men*
Martha Louise Oliver, A.M., R.N., *Assistant Director of Activities for Women*

Edward Ferero, A.B. in Govt., *Housing Assistant in the Office of the Director of Activities for Men; Managing Director, Dramatic Activities*
Judith Ellen Crumlish, *Secretary to the Director of Activities for Men*
Carlyn Sundberg, *Secretary, Office of the Director of Activities for Women*
Barbara Jo Brent, *Clerk-Typist, Office of the Director of Activities for Women*
Linda Myra Sennett, *Student Activities Assistant*

Intercollegiate Athletics

William Jennings Reinhart, B.B.A., *Head Baseball and Head Basketball Coach*
James Vernon Camp, A.M., *Head Football Coach*
Raymond George Hanken, B.S. in P.E., A.M. in Ed., *Assistant Football Coach*
Donald Gene Cochran, B.S., *Assistant Football Coach*
William Gerald Dooley, B.S., *Assistant Football Coach*
Robert Joseph Frulla, B.S. in P.E., *Assistant Football Coach*
George Klein, A.B. in Ed., *Assistant Basketball and Baseball Coach*
Harry Ledford, *Athletic Trainer*
Nancy Hanks Keim, *Secretary in the Department of Intercollegiate Athletics*

Musical Activities

Robert Howe Harmon, A.B., M.D., *Director of the Glee Clubs*
George Steiner, B.S., Mus.M., *Director of the Orchestra*
Grace Ruble Harmon, *Associate Director of the Glee Clubs*

VETERANS EDUCATION

Janet Wildman Johnson, A.M., *Assistant Director of Veterans Education*
Margaret Lamb, A.B., *Assistant to the Director of Veterans Education*

THE READING CLINIC

Joanne Bouthilet Parker, B.S., *Assistant Director*
Barbara Pogul Rivlin, Ed.M., *Clinician*
Grace Louise Toon, *Secretary*

UNIVERSITY HOSPITAL

Fred Augustus Menk, *Associate Administrator*
Francisco Paolo Ferraraccio, B.S., *Assistant Administrator*
Raymond Francis Whitehair, *Administrative Assistant*
John Charles Donaher, Jr., M.S., *Research Analyst*
Laura Beasley Brown, *Secretary, Office of the Medical Director*
Catherine Jeanne Simon, A.B., *Secretary, Office of the Administrator*
Sadie Estelle Oakley, *Chief, Admissions Department*
Robert Hamilton Thompson, B.S., *Director of Food Service*
Joanne Louise Styer, B.S., *Chief Therapeutic Dietician*
Charles Clark Hayes, *Executive Housekeeper*
Frank Leonard Sasher, *Manager, Laundry Department*
Madeline Lenora Brown, R.R.L., A.B., *Medical Record Librarian*
Margaret Ruth Emanuel, R.N., A.M., *Director of Nursing*
Louise O'Neal, R.N., A.B., *Assistant Director of Nursing*
Frederick Joseph Kessler, B.S., *Administrative Assistant, Outpatient Department*
Franklin Dero Cooper, M.S., *Chief Pharmacist*
Thelma Moore, *Chief, Telephone Department*

RESIDENCE AND SORORITY HALLS

Mary Wright, *Resident Director, Hattie M. Strong Hall*
Roxie La Preal Clapp Monson, *Assistant Director (Resident), Hattie M. Strong Hall, Assistant Director, Hancock Hall*
Beryl Cole, A.B., *Resident Director, Dolly Madison Hall*
Camille Ann Bures, *Resident Director, Hancock Hall*
Timothy Dean Mead, A.B., *Housing Assistant (Residence Halls for Men) and Resident Manager, John Quincy Adams Hall*
Jared Bradley, A.M., *Assistant Resident Manager, John Quincy Adams Hall*
Robert Lineberry, A.B., *Resident Manager, John C. Calhoun Hall*
Thomas Arden Warden, *Assistant Resident Manager, John C. Calhoun Hall*
Henry Agusiewicz, *Housing Manager, Welling Hall*

HISTORY AND ORGANIZATION

HISTORY

The idea of a university located in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all branches of polite literature:—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government."

It was George Washington's hope that the "General Government" would extend toward such an institution "a fostering hand". No steps were taken by Congress to carry out the provisions of Washington's will, and the stock he had bequeathed for the establishment of a university in the District of Columbia became valueless owing to the failure of the Potomac Canal properties.

Meanwhile, however, a movement was started by private persons under the leadership of Luther Rice to establish an institution of higher learning at the seat of the National Government for the education of the Baptist ministry and to afford general collegiate training. In 1819 an association was formed by Luther Rice, Obadiah B. Brown, Spencer H. Cone, and Enoch Reynolds for the purpose of raising funds to buy land for the use of the college.

A group of the Nation's leaders who were especially interested in Washington's idea became patrons of the college and contributed to funds raised for the purchase of land and erection of buildings. Among them were James Monroe, President of the United States; William H. Crawford, Secretary of the Treasury; John C. Calhoun, Secretary of War; William Wirt, Attorney General; Return J. Meigs, Postmaster General; and thirty-two members of Congress.

Legally to implement the college a petition was made to Congress for the incorporation of "the General Convention of the Baptist Denomination in the District of Columbia for evangelical and literary purposes". This petition was denied by Congress on April 26, 1820, because of its sectarian character.

Failing to obtain a denominational charter members of the association enlarged their objective to embrace national aims, and with the sponsorship of Government leaders there was presented in Congress a bill for the incorporation of "the Columbian Society for literary purposes", it being proposed to realize in this way "the aspirations of Washington, Jefferson and Madison for the erection of a university at the seat of the federal government."

Acting upon this second petition, on February 9, 1821, Congress chartered Columbian College in the District of Columbia, inserting in the charter by special action the provision "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College or denied any of the privileges, immunities or advantages thereof, for or on account of his sentiments in matters of religion".

Thus Columbian College in the District of Columbia was chartered by Congress as

one of the early nonsectarian institutions of higher learning in the United States, under the distinguished favor of President James Monroe and members of his Cabinet.

A tract of approximately forty-seven acres, extending about one-half mile northwest of Boundary Street (Florida Avenue) between Fourteenth and Fifteenth Streets, was purchased and by 1822 the main building was completed sufficiently to use.

Two years later, when the first Commencement was held on December 15, 1824, Congress and the Supreme Court adjourned their sessions to enable their members to attend the exercises. President Monroe, John Quincy Adams, John C. Calhoun, Henry Clay, and the Marquis de Lafayette headed the eminent company in attendance.

By an act of Congress of March 3, 1873, the name of the College was changed to "Columbian University", in recognition of the enlarged scope of the institution. In 1884 the University was moved from its first location on "College Hill", now Columbia Heights, to the new University Hall built for it at Fifteenth and H Streets. Nearby buildings accommodated the School of Medicine and somewhat later, the Law School.

For a period of six years, from 1898 to 1904, the University was placed under control of the Baptist Denomination. In 1904 an act restoring the original secular character of the University and authorizing change of name to The George Washington University was passed by Congress.

Subsequently all colleges, schools, and divisions of the University except the School of Medicine were brought together in the area bounded by Nineteenth, Twenty-third, and G Streets, and Pennsylvania Avenue NW. The School of Medicine is situated on H Street between Thirteenth and Fourteenth Streets NW.

The endowment of the University is $7,633,000.

PURPOSE AND OBJECTIVES

The purpose of The George Washington University expressed in the words of the Bill of Incorporation, introduced and subsequently enacted by Congress in 1821, was to realize "the aspirations of Washington, Jefferson, and Madison, for the erection of a university at the seat of the Federal Government." This central idea of a university functioning in the Capital of the Nation, nonsectarian, free of sectional limitations, conscious of its wide American relationships, and open to the ever-increasing international influences which bear upon it, has been continuous through nearly a century and a half.

The purpose of this University, therefore, has been to develop the university ideal in the place of greatest national significance, flexible before the changing needs of its growing national constituency and loyal to the traditional principles of learning and research, in providing through disciplined reason, wisdom for the individual and his society.

THE COLLEGES, SCHOOLS, AND DIVISIONS

The George Washington University includes fourteen colleges, schools, and divisions, as follows:

Columbian College of Arts and Sciences, through its lower and upper divisions, offers four-year programs in the arts and sciences leading to the degrees of Bachelor of Arts, Bachelor of Science, and (in cooperation with the Department of Pathology and the University Hospital) Bachelor of Science in Medical Technology. The lower division also provides the first two years of the prelegal and premedical programs, the preprofessional work required for admission to the schools of Pharmacy; Educa-

tion; and Government, Business, and International Affairs; and two-year terminal curricula in Accounting, Home Economics, Physical Sciences, and Secretarial Studies. Those in Accounting and Secretarial Studies lead to the degree of Associate in Arts; those in Home Economics and Physical Sciences lead to the degree of Associate in Science. The graduate division offers programs leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The National Law Center includes the Law School and the Graduate School of Public Law. The Law School offers professional courses leading to the degree of Bachelor of Laws. The Graduate School of Public Law offers programs leading to the degrees of Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering offers courses leading to the Engineering Technologists Certificate and the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering, Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

The School of Pharmacy offers courses leading to the degree of Bachelor of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics, and Bachelor of Science in Physical Education, and graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government, Business, and International Affairs offers work leading to the following degrees: (1) Bachelor of Arts in Government with a major in International Affairs or Public Affairs; (2) Bachelor of Business Administration with a major in Accounting, Business Administration, or Business and Economic Statistics; (3) Master of Arts in Government with a major field in International Affairs, Public Affairs, Public Administration, Personnel Administration, or Economic Policy; (4) Master of Business Administration with a major field in Accounting, Business and Economic Statistics, General Business Administration, Hospital Administration, or Personnel Administration; (5) Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University through its Off-Campus Division, Campus Division, and Division of Community Services. This College offers programs leading to the degrees of Associate in Arts; Associate in Science; Associate in Secretarial Administration; Bachelor of Arts; Bachelor of Science in Cartography; Master of Arts in the fields of Controllership, Governmental Administration, and Personnel Management; Master of Business Administration; and Master of Arts in International Affairs.

The Division of University Students makes available courses for mature students, not candidates for degrees in this University.

The Division of Special Students makes available courses for students in the process of qualifying for degree candidacy.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

ADMINISTRATIVE AND RESEARCH ACTIVITIES

Administrative Units

The University maintains the following Administrative Units: Health Administration, Veterans Education, the Reading Clinic, the Speech Clinic, and the Testing and Counseling Center.

Research Projects

Research projects sponsored by agencies of the Federal Government and by private foundations and industries are conducted. Cooperation between these projects and the various departments of instruction is as close as the nature and needs of the projects and departments will permit.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Medicine is a member of the Association of American Medical Colleges and is one of the medical colleges which have been continuously approved by the American Medical Association. The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy. The School of Engineering is on the accredited list of the Engineers' Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education.

LOCATION

The University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

GOVERNMENT

The government and general educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University as a member ex officio. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

EDUCATIONAL FACILITIES

BUILDINGS

Buildings, grounds, and equipment are valued at approximately $27,000,000.

The buildings of Columbian College of Arts and Sciences; the Graduate Council; the National Law Center: the Law School and the Graduate School of Public Law; the School of Engineering; the School of Pharmacy; the School of Education; the School of Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; the University Hospital and Outpatient Department; and the Cancer Clinic are located between Nineteenth and Twenty-fourth Streets and between Pennsylvania Avenue and G Street NW. The School of Medicine is at Fourteenth and H Streets NW. The buildings of the University are as follows:

John Quincy Adams Hall, 730 Nineteenth Street. Residence hall for men.

Bacon Hall, 2000 H Street. Named in honor of the late Joel Smith Bacon, President of the University from 1843 to 1854. Offices of the Dean of the Graduate Council, the Dean of the Graduate School of Public Law, the Dean for Sponsored Research, the Assistant to the President, the Development Division, the Forensic Medicine Institute, the Management Research Group, the Educational Counselor. Offices and lounge for the Law Faculty; the Alumni Office; Alumni Reception Room.

Binney Hall, 2018 Eye Street. Named in honor of the late Joseph Getchell Binney, President of the University from 1855 to 1858. Offices, classrooms, and laboratories of the Reading Clinic.

John C. Calhoun Hall, 2100 Eye Street. Residence hall for men.

Chapin Hall, 2128 H Street (rear). Named in honor of the late Stephen Chapin, President of the University from 1828 to 1841. Offices and classrooms of the Air Force ROTC.

Corcoran Hall, 725 Twenty-first Street. Named in honor of the late William W. Corcoran, benefactor of the University and a former member of the Board of Trustees. Offices of the Treasurer, the Cashier, the departments of Chemistry and Physics; Chemistry Research Project; the chemistry and physics laboratories; classrooms.

William H. Crawford Hall, 2119 H Street. Residence hall for women.

Davis-Hodgkins House, 731 Twenty-second Street. Offices and lounges of engineering students' organizations.

Everglades Apartments, 2223 H Street. Residence hall for nurses.

Faculty Club House, 714 Twenty-first Street.

Gymnasium, 2010–12 H Street.

Hall of Government, 710 Twenty-first Street. The gift of the late Mrs. Henry Alvah Strong, former Trustee of the University. Offices of the Dean of the School of Government, Business, and International Affairs; the departments of Accounting, Business and Public Administration, Economics, History, Political Science, and Statistics. Offices of the Air Force Advanced Management Program, Air Force Military and Economics Program, and Navy Graduate Financial Management Program; classrooms.

Harlan-Brewer House, 1923 H Street. Offices of law student organizations; lounges, reading rooms.

Health Care and Hospital Administration Building, 816 Twenty-first Street. Offices and seminar rooms of Health Care and Hospital Administration Program.

Hospital and Outpatient Department, Washington Circle.

Hospital Staff Office Building, 818 Twenty-second Street.

International House, 2110 G Street. Office of the Adviser to Students from Foreign Countries; club rooms.

Lisner Auditorium, 730 Twenty-first Street. The gift of the late Abram Lisner, former Trustee of the University. The Auditorium; Lisner Lounge; offices and classrooms of the Department of Speech, the Speech Clinic, and the housing officer; Athletic Ticket Office.

Dolly Madison Hall, 736 Twenty-second Street. Residence hall for women.

James Monroe Hall, 2115 G Street. Offices of the deans of Columbian College of Arts and Sciences, the Division of University Students, the School of Education; the departments of Education, English (English and American Literature), Germanic Languages, Journalism, Mathematics, Psychology, and Secretarial Studies; classrooms.

Office of the President, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Associate Dean of Faculties, Administrative Secretary, and department of Classical Languages.

Placement Office, 2114 G Street.

Samson Hall, 2036 H Street. Named in honor of the late George Whitefield Samson. President of the University from 1859 to 1871. Comptroller's Office; Disbursing Office; offices of the departments of Chemistry, Geology, and Physics.

School of Medicine, 1335–1339 H Street. Offices of the Dean and Staff of the School of Medicine; the Medical Library; laboratories; lecture rooms; research laboratories; student and faculty lounges; and University Medical Bookstore.

Sorority Halls:

2112 G Street. Apartments of Kappa Alpha Theta and Kappa Delta sororities.

2129 G Street. Apartments of Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Zeta Tau Alpha, and Kappa Kappa Gamma sororities.

2131 G Street. Apartment of Delta Gamma Sorority.

2137 F Street. Apartment of Alpha Epsilon Phi Sorority.

802 Twenty-first Street. Apartment of Phi Sigma Sigma Sorority.

Staughton Hall, 707 Twenty-second Street. Named in honor of the late William Staughton, President of the University from 1821 to 1827. Offices and laboratories of the Navy Logistics Research Project.

Stockton Hall, 720 Twentieth Street. Named in honor of the late Rear Admiral Charles Herbert Stockton, President of the University from 1910 to 1918. Law School; offices of the National Law Center and the Dean and Faculty of the Law School; library; and lecture halls.

Hattie M. Strong Hall, 620 Twenty-first Street. Named in honor of the donor, the late Mrs. Henry Alvah Strong, former Trustee of the University. Residence hall for women.

Student Union, 2125 G Street. Offices of student organizations, student cafeteria and snack bar, reading room, lounge, game and music room, and the "Lost and Found" Office.

Tompkins Hall of Engineering, 725 Twenty-third Street. The gift of the late Charles H. Tompkins, former Trustee of the University. Offices of the Dean of the School of Engineering; the departments of Civil, Electrical, and Mechanical Engineering; the programs in Engineering Administration, Engineering Science, and Metrology; the Center for Measurement Science; Electronics Research Project, Computer Research Project, National Aeronautics Space Administration; Engineering testing laboratories, general laboratories, drafting rooms, and classrooms.

University Book Store, 2120 H Street. University Medical Bookstore, 1335 H Street.

University Library, 2023 G Street. The gift of the late Abram Lisner, former Trustee of the University. The library, rooms of the Board of Trustees, Faculty Conference Room, classrooms, office of the Dean of the National Law Center.

The Helen L. and Mary E. Warwick Memorial Building, 2300 K Street. Diagnostic and treatment rooms, and research laboratories of The George Washington University Cancer Clinic.

Welling Hall, 814 Twenty-second Street. Named in honor of the late James Clarke Welling, President of the University from 1871 to 1894. Residence hall for men.

Woodhull House, 2033 G Street. Gift of the late General Maxwell Van Zandt Woodhull, former Trustee of the University. Office of the Director of Activities for Women; meeting rooms for student activities.

Building A, 2026 G Street. Offices of the Department of Romance Languages.

Building B, 2024 G Street. Offices, laboratories, and classrooms of the Department of Home Economics.

Building C, 2029 G Street. Offices of the Registrar and the Director of Admissions; offices and laboratories of the departments of Botany, Geology, and Zoology; language laboratories; classrooms.

Building D, 2013 G Street. Offices of the Business Manager, Maintenance; Mail Room; Human Resources Research Project.

Building E, 2003 G Street. Offices of the President, the Provost and Dean of Faculties,

Associate Dean of Faculties, and Administrative Secretary; office of the Department of Classical Languages.

Building F, 706 Twentieth Street. Offices of the Dean of the College of General Studies.

Building G, 712 Twentieth Street. Offices of the Department of English (Composition section); Academic Editor.

Building H, 714–16 Twentieth Street. Offices and locker rooms of the Department of Physical Education for Women.

Building I, 2135 G Street. Offices, classrooms, and laboratories of the Department of Geography.

Buildings J and L, 2131 and 2129 G Street (rear). Classrooms and locker rooms of the Department of Physical Education for Women.

Building K, 817 Twenty-third Street. Classroom, playing court, locker rooms, and office of the Department of Physical Education for Women.

Buildings M and N, 716–18 Twenty-first Street. Offices of the departments of Slavic Languages and Philosophy; offices and laboratories of the Testing and Counseling Center.

Building O, 2106 G Street. Offices of the Department of Religion and University Chapel.

Building P, 2108 G Street. Offices of the Student Health Service and the Dean of the Division of Special Students.

Building Q, 2029 H Street. Offices of the Director of Activities for Men, the Director of Veterans Education, and the Superintendent of Maintenance.

Building R, 2027 H Street. Offices of the Director of Athletics, and the Athletic Staff.

Building S, 2025 H Street. Offices of the Department of Physical Education for Men and Public Relations.

Building T, 2110 G Street. Offices of the Dean of the Summer Sessions; Chairman of Committee on Scholarships; International House (see International House).

Building U, 729 Twenty-second Street. Driver Behavior Research Project.

Building V, 2114 H Street. Research laboratories of the Department of Physics.

Building W, 2128 H Street. Offices of the Dean and Faculty of the School of Pharmacy; pharmacy laboratories; classrooms.

Building X, 2107 H Street. Offices of the departments of Art and Sociology and Anthropology; Music Program; Population Research Project; Faculty offices.

Building Y, 802 Twenty-first Street. Offices of the Department of Business and Public Administration, Center for Behavioral Sciences.

Building Z, 708 Twenty-second Street. Offices of the Patent, Trade-Mark, and Copyright Foundation.

LIBRARY FACILITIES

The Library collections of The George Washington University are housed in the University Library, the general library of the University; and in the departmental libraries of law, in Stockton Hall, and medicine, in the School of Medicine.

These collections contain approximately 361,100 volumes—278,600 in the University Library, 58,000 in the Law Library, and 24,500 in the Medical Library. Approximately 10,000 volumes a year are added to the Library's resources. Endowments, supplementing the University appropriation, provide books in the fields of American civilization, American Literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive 2,100 periodicals.

In the modern University Library building, erected in 1939, on the first three floors are the delivery hall, card catalogue, reference and main reading rooms, periodical room, and reserve book rooms; on the fourth floor are ten planned seminar rooms. To the original 135,000 volume eight-tier stack of modern steel construction has been added a similar unit of 170,000 volume capacity with 50 study carrels.

Of the special subject collections in the University Libraries, the most recent acquisition is the internationally known library of the Carnegie Endowment for International Peace, which was assembled during forty years of its activity in Washington, and was purchased by the University. The collection contains 50,000 bound

volumes and 20,000 pamphlets in the fields of international law and relations, history, and economics. Other collections in the Library are the W. Lloyd Wright collection of Washingtoniana, acquired in 1950; the Richard Heinzel Collection of Germanic philology and literature; the Curt Wachsmuth Collection of Greek and Roman literature, archaeology, and history; the Mount Vernon Collection on political history, international law, and the social sciences; a representative collection of Spanish American books, the gift of the governments of Hispanic America; and the Chauncey Mitchell Depew Public Speaking Collection.

Information concerning the use of the Libraries may be obtained at the Library service desks. A classified list on cards of selected recent acquisitions is available at frequent intervals, in addition to the complete information in the card catalogue. Monthly art exhibits are held on the first and second floors of the University Library during the academic year.

The hours of the University Library and the Law Library are Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.; Sunday, 2:00 to 6:00 P.M. The Medical Library is open Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.

The Library is administered for the curricular, reference, and recreational needs and interests of the students. Instruction in the use of the library is given in the required English courses, and by the reference librarians. The Library endeavors to assist students and all members of the University to use the rich library resources of Washington and the unusual opportunities they offer for extensive research. Interlibrary loan arrangements are maintained with other libraries in the city and in the United States.

The student has access to the Library of Congress, the Public Library of the District of Columbia and its branches, the library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many of the other great special collections of the government departments.

ADMISSION

The University accepts both men and women. Students are admitted at the beginning of each semester and summer session.

The right is reserved to refuse admission to any student with an academic record which creates doubt of his ability to succeed in college or who, for any other reason, would not be an acceptable student.

APPLICATION FOR ADMISSION AND READMISSION

Forms for application for admission or readmission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FE 8-0250, extension 344. The application for admission*, with a $10 application fee and a recent, signed photograph, should be returned to the Office of the Director of Admissions.

Application for admission or readmission for degree candidacy, together with all

required credentials, should be received by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions to insure consideration. Late applications will be considered only if the application form and all required credentials are received in the Admissions Office no later than two weeks prior to the first day of registration for the semester or session for which application is made. Exceptions may be made under extraordinary circumstances, at the discretion of the Director of Admissions.

Application for admission* to *nondegree status* in the Division of University Students must be received, with a $5 application fee and necessary credentials, no later than the Saturday preceding the first day of registration, as stated in the University calendar.

An applicant from a secondary school must send the high school record form provided by the University to his high school principal, with the request that the completed form be mailed directly *to the Office of the Director of Admissions.*

An applicant who has attended one or more institutions of higher learning must request each registrar to mail directly *to the Office of the Director of Admissions* a transcript of his record, *even though credits were not earned.* If high school units are not shown on the college transcript, the applicant should request his high school to submit a transcript to the Office of the Director of Admissions.

TEST INFORMATION

The requirement of tests for Columbian College of Arts and Sciences and School of Engineering applicants coming directly from secondary school is specified in the entrance statement of these divisions. The appropriate report of the Graduate Record Examination, when available, should accompany application for admission to graduate degree candidacy.

Arrangement for tests is the responsibility of the applicant and should be made with the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey, not less than one month before the date of the test. The Bulletin of Information, obtainable without charge, contains descriptions of the tests as well as rules regarding applications, fees, reports, and the conduct of the tests; lists of examination centers; examination dates; and an application blank. On the application for the test, the student should specify that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

College Entrance Examination Board tests are given at a large number of examination centers throughout the United States, including Washington, D. C.

If the Committee on Admission and Advanced Standing prescribes other tests, necessary instructions will be sent to the applicant by the Director of Admissions.

ADVANCED STANDING

Credit for Advanced Placement Examinations

Up to 30 semester hours of credit may be granted for college-level courses in an approved secondary school, if substantiated by satisfactory performance in the Advanced Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Place-

* An application for readmission does not require a fee unless it involves transfer to a college, school, or division of the University other than the one in which the applicant was last registered. In this case, a $5 transfer fee is required.

ment Examinations, Educational Testing Service, 20 Nassau Street, Princeton, N. J.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the courses of study completed by the applicant.

Credit from Higher Institutions

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University. It may be allowed provisionally, and it may be withdrawn for subsequent poor work. Work of low pass grade (*D* or the equivalent) will not be considered for transfer.

The student must be in good standing as to scholarship and conduct. He must be eligible to return to the last previously attended institution in the semester for which he seeks admission to this University.

READMISSION

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded), must apply for readmission in the Office of the Director of Admissions. (See closing dates for application for admission, pages 8–9.) If he applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of the Director of Admissions from each institution attended. Applications for readmission are considered on the basis of regulations currently effective.

TRANSFER WITHIN THE UNIVERSITY

For information concerning transfer from one college, school, or division to another within the University, see page 41.

ENTRANCE REQUIREMENTS*

Good character and an academic background appropriate for the program of studies contemplated are required.

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Lower Division

Requirements for admission to the freshman class are as follows:

1. An acceptable certificate of graduation from an accredited secondary school, showing at least fifteen units†. The program of study *recommended* for students entering in September 1962 and *required* of students entering in February 1963 and thereafter is as follows: four years of English; at least two years of one foreign language; two years of science, preferably with laboratory instruction; two years of social study, one of which must be American history; and two years of college pre-

* Entrance requirements are established by the faculties of the several colleges, schools, and divisions. The Director of Admissions, as agent for the faculties, administers regulations governing admission, readmission, and transfer.

† A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods, or the equivalent, of prepared classroom work.

paratory mathematics. It is to be noted that one unit of algebra, or the equivalent, is prerequisite to courses in chemistry, mathematics, physics, and statistics, and that in addition one unit of plane geometry, or the equivalent, is prerequisite to courses in mathematics and physics.

2. The principal's statement that the applicant is prepared to undertake college work.

3. College Entrance Examination Board scores must be submitted on the Scholastic Aptitude Test.

Beginning February 1963 scores must also be submitted on the English Composition Achievement Test. Applicants are urged to submit scores on two additional achievement tests in subjects reflecting their major interests.

It is recommended that the examinations be taken in December or January. Scores on tests taken in the Junior year may be submitted. Arrangement for tests should be made with the Educational Testing Service, 20 Nassau Street, Princeton, N. J., not less than one month before the date of the test. In applying for the test, the student should specify that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications of an applicant who, because of unusual circumstances, does not present all the formal requirements stated above. The Committee may prescribe appropriate tests.

Upper Division

Bachelor of Arts.—Sixty-four hours of academic work based on the *Arts and Letters* curriculum in the lower division, or the equivalent (see pages 52 and 53).

Bachelor of Science.—Sixty-four hours of academic work based on the *Science* curriculum in the lower division, or the equivalent (see page 53).

Bachelor of Science in Medical Technology.—Sixty-four hours of academic work including Biology 1–2*, Chemistry 11–12, and Microbiology 112, or the equivalent (see page 53).

Graduate Division

An approved Bachelor's degree from an accredited higher institution; an appropriate distribution of courses; and a superior quality of work in the major field are required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but he may be required to take extra work.

Applications for admission must be approved by the department and by the Dean.

Master of Arts.—A Bachelor of Arts degree at this University with a major in the chosen field, or the equivalent.

Master of Science.—A Bachelor of Science degree at this University with a major in the chosen field, or the equivalent.

Master of Fine Arts (1) *in the field of Painting or Sculpture.*—A Bachelor of Arts degree at this University with a major in drawing and painting, sculpture, or commercial art, or the equivalent. (2) *In the field of Dramatic Art.*—A Bachelor's degree from an accredited college or university. Desirable undergraduate background includes courses in literature, drama, and the theater. Applicants with academic deficiencies may be enrolled in the program subject to the satisfactory completion of prescribed courses.

* An interdepartmental course offered by the departments of Botany and Zoology.

THE GRADUATE COUNCIL

Doctor of Philosophy.—Acceptable personal qualities and the capacity for creative work are required, together with a Bachelor's degree with a major in the proposed field or the equivalent, for provisional status; or one year of acceptable graduate work, for full status.

THE SCHOOL OF MEDICINE

Doctor of Medicine.—Well-qualified candidates are eligible for admission after completing 90 semester hours, or the equivalent, applicable toward a degree in an approved college. However, the majority of applicants are better prepared for the study of medicine after four years of college work. Applicants are required to take the Medical College Admission Test, sponsored by the Association of American Medical Colleges, in advance of the year for which application is made. Specific required courses are:

Biology (including 4 hours of laboratory) 8
A course in either general biology or zoology
Chemistry:
Inorganic (including 4 hours of laboratory) 8
Qualitative analysis may be counted as part of this requirement.
Organic (including laboratory) 6–8
The equivalent of a one-year college course
English Composition and Literature 6
Physics (including at least 2 hours of laboratory) 8

Except for these requirements applicants are urged to follow personal interest in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

Advanced Standing

A student who has satisfactorily completed part of the requirements for the degree of Doctor of Medicine may apply for advanced standing if his work has been equivalent to that required by The George Washington University School of Medicine. Before final admission to the third year class, the applicant must have passed Part I of the National Board Examinations.

Selection Procedures

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed only by invitation of the Committee.

Each applicant is notified of the Committee's decision as soon as possible.

An applicant who is offered a place in a class must notify the Director of Admissions, within two weeks, of his intent to accept the place reserved for him and must remit a deposit of $100 not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Forms for a report on physical condition accompany the offer of a place in class. This report must be completed and returned to the Director of Admissions by the applicant's physician within two months of receipt of the letter of acceptance.

THE NATIONAL LAW CENTER

The Law School

Bachelor of Laws.—An approved Bachelor of Arts or equivalent degree from an accredited college or university; a satisfactory quality of work; and an acceptable distribution of courses are required. Eligibility is based on personal and scholastic records and on the result of the Law School Admission Test. No applicant will be accepted who is ineligible to return in good standing to a previously attended law school. From the applicants, a selection is made by the Committee on Admissions.

Information concerning the Law School Admission Test may be obtained from the Dean of the Law School or from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

Advanced Standing

Advanced standing toward the degree of Bachelor of Laws is granted only for work successfully completed in other law schools which are members of the Association of American Law Schools. Transferred credits will not be recognized in excess of those which might be earned in a similar period in this Law School.

Advanced standing will not be granted for law work already counted toward the Bachelor of Arts or other pre-legal degree.

Unclassified Students

A degree candidate in good standing at another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student to earn credits for transfer to the other law school.

The Graduate School of Public Law

Candidates must be accepted by the Faculty of the School.

*Master of Laws.**—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a minimum average of 75 on all work done for the Bachelor of Laws degree, except that at the discretion of the Faculty applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative. Advanced standing will not be granted for credits earned while a candidate for the first degree in law or for credits earned at another law school. Credits earned as an unclassified student will not be applicable toward meeting the requirements for the degree unless specific provision therefor is included in the letter of admission.

Master of Comparative Law and *Master of Comparative Law (American Practice).*—The following are required: (1) the successful completion of and graduation from a gymnasium, lycee, or liceo; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university; a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association

* One-half of the work necessary for graduation from an approved college or university completed prior to entry into military service may be accepted as satisfying the admission requirement for pre-legal work provided the applicant completed not less than twenty months of continuous service in the armed forces of the United States during World War II and prior to the beginning of the 1948-49 fall semester.

of American Law Schools; and outstanding capacity for scholarly work in the field of law.

Unclassified Students

A member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this School.

Continuing Legal Education Students

A simplified admission and registration procedure is used for members of the bar who desire to take courses on a noncredit basis. Continuing Legal Education students may not participate in student activities or benefit from the medical privileges of the University.

THE SCHOOL OF ENGINEERING

Good character and an academic background appropriate for the program of studies contemplated are required.

For Undergraduate Study

For the Engineering Technologist Certificate and Degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering.—Admission is based on the following factors:

1. An acceptable certificate of graduation from an accredited high school showing at least fifteen units*
2. The principal's statement that the applicant is prepared to undertake college work
3. *Until February 1963* College Entrance Examination Board scores must be submitted on the Scholastic Aptitude Test *only*. *Beginning February 1963* scores must *also* be submitted on the English Composition Achievement Test and a Mathematics Achievement Test. If the applicant studied trigonometry in high school he should take the Advanced Mathematics Achievement Test; if he did not study trigonometry in high school, he should take the Intermediate Mathematics Achievement Test. (For details, see page 9.)

The qualifications of applicants who, because of unusual circumstances, do not meet the above requirements will be considered by the Committee on Admission and Advanced Standing. The Committee may prescribe admission tests.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. General Science may not be counted in satisfaction of the science requirement but may be counted as an elective unit.

It is recommended that *both* physics and chemistry be studied in high school. Study of these sciences contributes to the student's general education, aids in his choice of a career, and affords a qualitative measure of his ability and potential for engineering study. Superior students are encouraged to begin collegiate study

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

of physics or chemistry at the highest level consistent with their preparation, by the use of waiver examinations.

The study of solid geometry is recommended, in order that the student may have a firm foundation for his collegiate studies in mathematics.

Quantitative Deficiency.—A graduate of an approved high school who does not offer for admission the particular subjects required for the engineering curriculum, but who does present not less than fifteen acceptable units, may be admitted to pursue a prescribed program of studies including courses to make up for deficiencies if the deficiency in distribution does not exceed two units.

Qualitative Deficiency.—In the Summer Sessions of 1962 a special program will be available for a limited number of applicants for full time study who do not fully meet qualitative admission requirements. In order to meet the qualifications for admission to degree candidacy all courses in the special program must be passed with an average grade of *C* or better.

Applicants for part time study will be admitted fall, spring, or summer, but must complete the prescribed program of two courses in that semester.

Advanced Standing

Credit for Advanced Placement Examinations.—Advanced standing may be granted for study at the collegiate level in advanced courses in an approved secondary school, if substantiated by satisfactory performance in the Advanced College Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the course of study completed by the applicant.

Total credit that may be so granted is ordinarily limited to 15 semester hours, not more than 8 semester hours of which may be in any one examination area. In exceptional cases these limits may be exceeded, but in no case will the credit granted exceed 30 semester hours.

Credit from Higher Institutions.—Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University, and subject to the general University regulations concerning satisfactory subsequent work. Work of low pass grade (*D* or the equivalent) will not be considered for transfer.

For Graduate Study

Master of Engineering Administration and *Master of Science in Engineering.*—For admission to graduate study the student must have a Bachelor's degree from a recognized institution and he must satisfy the Committee on Graduate Studies of his capacity for productive work in the field selected.

Applicants who have significant deficiencies in their preparation may qualify for admission to graduate study by taking prescribed undergraduate courses.

In some cases such study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

For Degree Candidacy

Master of Engineering Administration and *Master of Science in Engineering.*—Application for admission to candidacy must be made in writing to the Committee on Graduate Studies. For details see "The Master's Degrees" in the section of this CATALOGUE devoted to the School of Engineering.

Doctor of Science.—For admission the student must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

THE SCHOOL OF PHARMACY

For the Bachelor's Degree

Bachelor of Science in Pharmacy.—The satisfactory completion of the *Pharmacy* curriculum in the lower division of Columbian College of Arts and Sciences (see page 54), or the equivalent.

A student who has a Bachelor's degree from an accredited institution or who has completed work in the general cultural or foundational subjects of the pharmacy curriculum may be admitted to advanced standing. No more than one year of advanced standing will be granted a student from any institution other than an accredited college of pharmacy.

THE SCHOOL OF EDUCATION

For the Bachelor's Degrees

*Bachelor of Arts in Education, Bachelor of Science in Home Economics**, and *Bachelor of Science in Physical Education.*—The satisfactory completion of the appropriate curriculum in the lower division of Columbian College of Arts and Sciences (see pages 54–56); the equivalent from another accredited higher institution; or a certificate of graduation from an approved normal school or the equivalent is required. With the exception of Home Economics, applicants must have personality traits that give promise of success as a teacher.

For the Master's Degree

Master of Arts in Education.—To be admitted to candidacy for this degree the applicant must: (1) hold a Bachelor's degree from an accredited institution; (2) have an undergraduate quality-point index of 2.50 or above (*C*+ average); (3) have demonstrated a genuine interest in teaching; (4) have personality traits that give promise of better-than-average success as a teacher.

To be admitted to candidacy in programs designed to prepare for service in guidance and administration two years of successful teaching experience are required.

For the Advanced Professional Certificate

Advanced Professional Certificate.—The degree of Bachelor of Arts in Education or the degree of Bachelor of Science in Physical Education from the School of Edu-

* Open only to students enrolled in the Home Economics curriculum of the lower division of Columbian College of Arts and Sciences as of September 1961 or earlier. This degree will be conferred for the last time June 1965.

cation, or the equivalent from another institution of higher learning; a Master's degree from an accredited institution of higher learning; at least two years of successful teaching experience; and a permanent teaching license.

For the Doctor's Degree

Doctor of Education.—The degree of Master of Arts in Education, or the equivalent, and at least three years of satisfactory educational experience.

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

For the Bachelor's Degrees

Bachelor of Arts in Government.—The satisfactory completion of the *International Affairs* and *Public Affairs* curriculum in the lower division of Columbian College of Arts and Sciences (see page 56), or the equivalent.

Bachelor of Business Administration.—The satisfactory completion of the *Accounting and Business Administration* or the *Business and Economic Statistics* curriculum in the lower division of Columbian College of Arts and Sciences (see pages 56 and 57), or the equivalent.

For the Master's Degrees

A Bachelor's degree from an accredited college or university is required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but may be required to take work above the minimum requirements.

Students admitted to candidacy must have attained a quality-point index of 3.00 (a *B* average) in the undergraduate major.

Master of Arts in Government

In the field of International Affairs or *Public Affairs.*—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

In the field of Public Administration.—An undergraduate major in a social science or equivalent work experience.

In the field of Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology.

In the field of Economic Policy.—An undergraduate major in economics at this University, or the equivalent.

Master of Business Administration

In the field of Accounting or *Business and Economic Statistics.*—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

In the field of Business Administration.—(1) In general business administration: a Bachelor of Business Administration degree at this University, or the equivalent, is required. Applicants who are deficient in such course work may be admitted and will be required to make up deficiencies over and above the normal Master of Business Administration program. (2) In the field of Hospital Administration: a Bachelor's degree from an accredited college or university is required. While a 3.00 average in the undergraduate major is generally required, in the selection of candi-

dates consideration will be given to personal qualifications, aptitude for hospital administration, and practical experience.

In the field of Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology.

For the Doctor's Degree

Doctor of Business Administration.—A Master's degree in Business Administration or a related field, or the equivalent, and proficiency in statistics and accounting to the satisfaction of the Committee on Doctoral Studies are required.

THE COLLEGE OF GENERAL STUDIES

See the section of this Catalogue devoted to the College of General Studies.

THE DIVISION OF UNIVERSITY STUDENTS

Students 21 years of age or over who are not interested in working for a degree in this University may be considered for admission to the Division of University Students to take courses for which they have adequate preparation, as evidenced by previous scholastic records.

Students under 21 years of age who meet the entrance requirements of Columbian College of Arts and Sciences but who are not seeking degree candidacy at this University may be admitted to the Division of University Students to pursue programs of study approved by the Dean.

If a student currently or previously registered in the Division of University Students applies for admission to degree candidacy, a maximum of 45 semester hours of credit will be considered for assignment, in so far as these credits are appropriate toward the degree sought.

In special instances, with the permission of the instructor, a person may be considered for admission as an auditor in a class without being required to take active part in the exercises or to pass examinations, but no credit will be allowed for such attendance.

THE DIVISION OF SPECIAL STUDENTS

This is a non-degree-granting division of the University in which the Director of Admissions may authorize the placement of students in the process of making up entrance deficiencies to degree-granting colleges and schools of the University.

Complete credentials must be submitted and evaluated before a tentative or definite plan of make-up may be prepared.

THE DIVISION OF AIR SCIENCE

The applicant must be a regularly enrolled, full-time, student; at least fourteen years of age; a citizen of the United States; physically fit; of good character; and a candidate for a Bacheror's degree.

CLASSIFICATION OF STUDENTS

Regular Students.—Regular students are those who have met the entrance requirements for candidacy and are registered for degrees.

University Students—Persons not seeking degrees, as specified in the rules of the

Division of University Students, may be admitted to this Division to pursue courses for which they have had adequate preparation.

Special Students—Special students are those who are in the process of qualifying for admission to curricula in degree-granting colleges and schools of this University.

Additional information concerning curricula, courses offered, entrance requirements, or admission procedure may be obtained from the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone—FEderal 8-0250, extension 344.

REGISTRATION*

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions (see "Admission", pages 8–18).

A student previously registered in the University who was not on-campus during the immediately preceding semester (summer session excluded), must apply for readmission in the Office of Admissions (see page 10).

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in this University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the writtten permission of the deans concerned, *prior to registration.* Allowance for credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

Time and Place of Registration

Registration for all colleges, schools, and divisions except as listed below is conducted in Building C, 2029 G Street NW., during the following periods: *fall semester,* September 20 and 21, 12:00 to 8:00 P.M.; September 22, 10:00 A.M. to 1:00 P.M. *Spring semester,* January 31 and February 1, 12:00 to 8:00 P.M., February 2, 10:00 A.M. to 1:00 P.M.

For the Law School and the Graduate School of Public Law: Stockton Hall, 720 Twentieth Street, NW., days and hours as listed above.

For the School of Engineering: Tompkins Hall, 725 Twenty-third Street NW., undergraduate: days and hours as listed above. For graduate students: *fall semester*—September 18 and 19; *spring semester*—January 29 and 30, 11:00 A.M. to 8:00 P.M.

For the School of Medicine, School of Medicine, 1335 H Street NW., September 13, 10:00 A.M. to 4:00 P.M.

For the College of General Studies: at times and places designated in individual course announcements.

Registration Changes and Withdrawals

For regulations governing changes in registrations and withdrawals, see pages 21, 22–23, 40–41.

* For "in residence" status see *Residence,* page 42.

ERRATA

The Board of Trustees of The George Washington University, on March 15, 1962, authorized the following changes in fees as stated in the 1962-63 catalogues for the School of Medicine, the Law School, the School of Engineering, Columbian College of Arts and Sciences, the Division of University Students, and the general catalogue of the University. These fees become effective September 1, 1962.

TUITION FEES:

Except for students registered in the Law School, the School of Engineering, the College of General Studies Off-Campus Division, for work toward a Master's Degree in Engineering, and for work leading to a Doctor's degree:	
Full-time program (15 hours or more): for each semester*	$500.00
Part-time program:	
For each semester hour for which the student registers*	33.00
For each semester hour for which the student registers for courses in Departments of Instruction in the School of Engineering	38.50
In the School of Engineering:	
Full-time program (15 hours or more): for each semester	550.00
Part-time program:	
For each semester hour for which the student registers	38.50
For each semester hour for which the student registers for courses in Departments of Instruction other than in the School of Engineering	33.00
In the Law School and the Graduate School of Public Law:	
Full-time program (12 hours or more): for each semester	450.00
Part-time program: for each semester hour for which the student registers	33.00
For the degree of Doctor of Medicine, for two semesters†	1,350.00
For the degree of Doctor of Philosophy‡, Doctor of Education, or Doctor of Business Administration:	
For work§ leading to and including the general examination	1,100.00
For work leading to and including the final examination	1,100.00
For the degree of Doctor of Juridical Science:	
For work leading to and including the final examination	1,100.00
For the Master's degrees in Engineering:	
For work leading to and including the comprehensive examination‖	1,000.00

RESIDENCE FEE:

Charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements.** Due and payable on the official days of registration:	
In the Law School and the Graduate School of Public Law	33.00
In the School of Engineering	38.50
In all other colleges, schools, and divisions, except the School of Medicine	33.00

COURSES OF INSTRUCTION:

Tuition fees specifically stated in descriptions of courses are changed as follows:

Education—297. Tuition fee, $33.

English—1X. Tuition fee, $124 (the regular fee of $33 a semester hour, plus an additional fee of $25).

German—47. Tuition fee, $99.

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* Payment of tuition for a Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

† Registration in the School of Medicine is for a period of two semesters. After the student has entered the course of instruction he is obligated for the full tuition for two semesters. No part of the tuition will be refunded upon withdrawal or dismissal for any cause.

‡ The tuition fee is to be paid in two years at the rate of $275 a semester or in full at the time of registration. No residence fee will be charged if a third year is needed for completion of either part of the degree requirements.

§ This fee does not cover the cost of tuition for elementary courses (numbered 1 to 100).

‖ Any student admitted to Master's study may elect to pay the total fee at the beginning of his program or on a course-by-course basis at $38.50 a semester hour until the total fee is paid.

Students completing payment of the total fee before completion of the required work (including thesis and comprehensive examination) will be granted registration on an "in residence—no charge" basis for one semester immediately following the semester in which tuition payment is completed.

Students requiring additional time for completion of required work after completion of payment of the total fee and the expiration of a semester "in residence—no charge" must register "in residence" each semester and pay the normal "in residence" fee.

** Payment of the residence fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the requirements which were in force at the time of his first registration but does not count as part of the residence requirement for the degree.

and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

Graduation Fees

Wherein the degree of Associate in Arts or Associate in Science is granted	10.00
Wherein the Engineering Technologist Certificate is granted	10.00
Wherein a degree other than the Associate in Arts or Associate in Science degree is granted	25.00
Wherein an Advanced Professional Certificate in Education is granted	25.00
Fee for Binding Master's Thesis	6.00
Fee for Printing Summary of Doctoral Dissertation	85.00

Special Fees

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application fee, charged each applicant for admission to nondegree status, nonrefundable	5.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Admission tests (when required)	6.00–12.00
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree in Columbian College of Arts and Sciences; the School of Engineering; the School of Government, Business, and International Affairs; or the College of General Studies at the time of registration for the final semester of study (excluding summer sessions)	10.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program: dropping or adding a course, changing from one section to another within a course, change of status (from auditor to credit status or vice versa), and change in credit hours for a course	2.00
Withdrawal fee, charged in special cases	5.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees")	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
Residence fee, charged each student granted "leave of absence" status for the academic year in the School of Medicine	50.00
Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements.† Due and payable on the official days of registration:	
In the Law School and the Graduate School of Public Law	30.00
In the School of Engineering. (See footnote on page 20)	35.00
In all other colleges, schools, and divisions, except the School of Medicine	30.00
For special physical examination	2.00
Special fee, Law School (Student Bar Association activities, *Law Review*, and other services), charged each student in the Law School for each semester or any part thereof except the summer term	10.00
Engineers' Council fee, charged each student in the School of Engineering for each semester or any part thereof except the summer term	1.50
For each examination to qualify for advanced standing and for each special examination	5.00
English test for foreign students (when required)	5.00

* Payable at the time of application for transfer or readmission.

† Payment of the residence fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the requirements which were in force at the time of his first registration but does not count as part of the residence requirement for the degree.

Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor	3.00
Transcript fee, charged for each transcript of record after the first	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under Health Administration. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or attend classes until all fees are paid. Fees are due and payable in advance at the time of each registration.

With the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration. Installment-due notices are mailed. However, nonreceipt of notice is no excuse for failure to meet obligations when due.

A student who fails to meet payments when due, but pays his fees within the following two weeks of the date on which payment is due, is charged a $2 service fee. A student who fails to meet payments within these two weeks after payment is due is automatically suspended and may not attend classes until he has been officially reinstated and paid all accrued fees and a $5 reinstatement fee.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the dean of the college, school, or division in which the student is registered. Notification to an instructor is not an acceptable notice (see "Withdrawal", page 40).

In authorized withdrawals and changes in schedule, financial adjustments will be made as follows:

Fall Semester

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in October or Novem-

* The University work week is Monday through Friday, inclusive.

ber, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of tuition charges.

SPRING SEMESTER

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

A student enrolled in a full-time program, who drops or adds a course and continues to be in a full-time program, will have no financial adjustments of tuition made other than those involving course fees.

In no case will a refund be made of the first third of the total tuition charges. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this be credited to another semester.

Students in chemistry or pharmacy who fail to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a $3 checkout fee. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Students enrolled in the ROTC who fail to turn in uniforms, equipment, and textbooks, on separation from the Corps, are charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

FELLOWSHIPS, GRADUATE SCHOLARSHIPS, AND ASSISTANTSHIPS

The following fellowships, graduate scholarships, and assistantships are available. Unless otherwise specified, applications should be submitted not later than March 1 preceding the period for which the award is to be made. They should be directed to the chairman of the department or the dean of the school concerned and addressed to The George Washington University, Washington 6, D. C.

* The University work week is Monday through Friday, inclusive.

University Teaching Fellowships.—Assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to $2,000 plus tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Tuition and laboratory fees may not exceed $500. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the chairman of the department of instruction concerned.

Graduate Teaching Assistantships.—Open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to $2,000 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Tuition and laboratory fees may not exceed $600. Application should be made to the chairman of the department of instruction concerned.

Law School Research Assistantships.—Available each year to students currently enrolled in the Law School, preferably to applicants who are completing the second year. Each assistant receives an annual stipend. Awards are made on the basis of academic standing, financial need, and capacity for leadership. Research assistants have duties similar to those of teaching fellows. Applications should be submitted to the Dean of the Law School not later than May 1.

Graduate School of Public Law Teaching Fellowships.—Available each year to prospective candidates for the Master of Laws degree. Each fellow receives an annual stipend, plus tuition for the academic year. Teaching fellows follow an approved program of study and research, assist members of the Faculty in the guidance of first-year students, and supervise student work in legal bibliography and the drafting of legal instruments. Upon satisfactory completion of the year's work, a fellow is recommended for the degree of Master of Laws. Applications should be submitted to the Dean of the Graduate School of Public Law not later than March 15.

American Security and Trust Company Fellowship (1960).—A two-year fellowship of $2,000 a year is available to a graduate student in business administration or economics in the School of Government, Business, and International Affairs.

Winfield Scott Blaney Fellowship in International Affairs (1961).—Bequest of Jeannette Blaney Strayer in memory of her father. The income from this fund, up to $1,200, is used to provide fellowships for graduate students in a field of international relations, in the School of Government, Business, and International Affairs.

Frederick Albert and Alma Hand Britten Scholarships (1959).—Bequest of Alma Hand Britten to provide tuition aid to incoming graduate students who would not otherwise be able to pursue their studies in the School of Engineering. Scholarships are awarded on the basis of need and scholarship. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean of the School of Engineering.

Samuel Jordan Graham Fellowship in Surgery (1961).—By bequest, in memory of Judge and Mrs. Graham. The income from this fund, up to $2,000, may be used to assist students who are pursuing postgraduate study or research, preferably in surgery, at the School of Medicine.

If no individual is conducting such work or deserving of the award, the income

may be used to provide one or more scholarships (to cover tuition and other school expenses deemed appropriate) for undergraduate students in the School of Medicine.

Gilbert Grosvenor Teaching Fellowship (1961).—Established by the National Geographic Society in honor of Dr. Grosvenor, an honorary trustee of the University. Awarded to a doctoral candidate in the field of human geography, with stipend up to $1,700 and tuition fee for work leading to and including the General Examination or the Final Examination, as appropriate. Application forms are available in the Department of Geography.

Isbella Osborn King Research Fellowships (1927).—By bequest, fellowships varying in amount from $750 to $3,000 are offered in the biological sciences to foster research for which the libraries and scientific establishments in Washington provide special facilities.

Law School Scholarships.—Available each year in the Law School to graduates of accredited colleges. Each scholarship provides full three-year tuition in the morning division of the Law School. Candidates must have graduated in the upper fifth of their class and must have demonstrated qualities of leadership in addition to scholastic attainment. To retain the scholarship, the successful candidate must maintain a *B* average. Application must be made before March 1 to the Dean of the Law School.

Tuition scholarships are also available to second- and third-year full-time students with averages of 75 and above. Applications should be made to the Dean of the Law School prior to July 1. Scholarships are awarded after spring-semester grades are reported.

Robin Miller Research Fellowship (1953).—An $1,800 fellowship established by bequest of Mrs. Robin Miller for the study of cardiovascular diseases.

National Defense Graduate Fellowships.—Under the National Defense Education Act, fellowships are available at this University in Germanic Languages and Literatures and in Romance Languages and Literatures at $2,000 (with an increase of $200 each for the second and third years) plus $400 a year for each dependent; tuition is waived. Application should be made to the Graduate Council.

National Science Foundation Cooperative Graduate Fellowships.—Fellowships at $2,200 for twelve months or $1,600 for nine months, with tuition waived, are available in the mathematical, physical, medical, biological, and engineering sciences and in certain other fields regarded as employing scientific methods.

National Science Foundation Summer Fellowships for Graduate Teaching Assistants.—Summer fellowships are available at not less than $50 or more than $75 a week for a period of 8 to 12 weeks; tuition is waived. Application should be made to the Graduate Council.

Thomas Bradford Sanders Fellowships (1928).—Fellowships in departments of science, varying in amount from $900 to $1,500 plus tuition, established by bequest of Addie Sanders in memory of her brother.

Scottish Rite Fellowships.—The Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction, U.S.A., offers fellowships each in the amount of $2,200, to graduates of accredited colleges who wish to enroll in the School of Government, Business, and International Affairs, to train for government leadership—federal, state, or local. The territory includes the Orients of Alabama, Alaska, Arizona, Arkansas, California, Colorado, District of Columbia, Florida, Georgia, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia,

Washington, West Virginia, Wyoming, Panama, Puerto Rico, and the Bodies of Taiwan, Japan, Okinawa, and Guam.

These fellowships are made possible by annual gifts and are available to residents of the respective states or countries, and application therefore should be made to the Sovereign Grand Inspector General of the Supreme Council, 33°, of the Southern Jurisdiction, U.S.A., of the Orient state or country from which the application is to be made. Direct inquiries to Assistant to the President, The George Washington University.

Wolcott Foundation Fellowships.—Sponsored by the Wolcott Foundation of High Twelve International and available to graduates of accredited colleges who wish to enroll in the School of Government, Business, and International Affairs for graduate work in International Affairs, Public Administration, Personnel Administration, or Business Administration. Preference is given to students who themselves are affiliated with, or whose parents are affiliated with, High Twelve International or the Masonic Order. The fellowships cover tuition for one calendar year of graduate study in residence. Where need is shown, a living allowance up to $100 a month may be granted. Direct inquiries to Assistant to the President, The George Washington University.

SCHOLARSHIPS

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work (fifteen semester hours or in the professional schools, the full prescribed schedule) during the period for which the scholarship is awarded.

Scholarship application should be made in writing on or before April first for the following academic year and, unless otherwise specified, should be addressed to the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C. Awards are made during the month of April. All scholarships begin with the fall semester.

The following is a listing of the scholarships available to The George Washington University students, the donors who make them possible, and the year each scholarship was instituted at this University.

Open to Incoming Freshmen

The following scholarships are awarded to outstanding members of graduating classes of accredited secondary schools. Applicants must be citizens of the United States who are not receiving veterans' benefits under any public law.

Applicants must apply for admission to the University and be accepted before their scholarship applications can be considered. Forms for application for admission to the University are available at the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

Alpha Zeta Omega Scholarship (1950).—A $500 scholarship established by Pi Chapter awarded annually to a member of the graduating class of one of the public high schools of the District of Columbia, nearby Maryland, or Virginia who intends to complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Alumni Scholarships.—Five scholarships are available each year in the lower division of Columbian College of Arts and Sciences, upon recommendation of alumni or regional alumni clubs, to outstanding graduates of accredited high schools outside the

Metropolitan area of Washington, D. C. These scholarships provide full tuition for four academic years, beginning with the fall semester (excluding summer work and special fees). The student must maintain a *B* average. For information write to the Director of Alumni Relations.

American Legion Auxiliary Scholarship (1960).—Established by the Department of the District of Columbia, American Legion Auxiliary, and available to a veteran's daughter in need of assistance.

Association of Federal Communications Consulting Engineers Scholarship (1958).*—A full-tuition scholarship, including laboratory fees and books. Available to a student of good character, promise, and leadership working toward the degree of Bachelor of Electrical Engineering and intending to major in communications.

Frederick Albert and Alma Hand Britten Scholarships (1959).—Bequest of Alma Hand Britten for scholarship aid to needy students preparing for the engineering profession. Application forms are available in the Office of the Dean of the School of Engineering.

Crown Photo Scholarship (1958).—A $500 scholarship established by the Crown Photo Service of Washington. Awarded annually to a member of the graduating class of one of the public high schools of the District of Columbia, nearby Maryland or Virginia, who intends to complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

District of Columbia Pharmaceutical Association Scholarship (1954).—A $500 scholarship awarded annually to a member of the graduating class of one of the public or parochial high schools of the District of Columbia, nearby Maryland or Virginia, who intends to complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Estella Constance Drane Scholarship (1957).—By bequest, in memory of the boys of the former Washington Business High School who served in World War I. Provides an annual partial scholarship to a graduate of Roosevelt High School.

School of Engineering Scholarships.—Four scholarships are awarded each year to graduates of accredited high schools. Each scholarship provides full tuition for four academic years (excluding summer work and special fees), provided the student maintains an average of *B* and a satisfactory standard of deportment.

Applications must be made before March 1 for the following academic year. Application forms are available in the Office of the Dean of the School of Engineering.

General Motors College Scholarship (1955).—Awarded to an incoming freshman with outstanding talent, high personal qualifications, and financial need. The amount is flexible varying from $200 to $2,000 a year, depending upon the need of the individual. It is renewable for the four years of undergraduate work provided the student continues to meet the high standards established for the holder of this award.

High School Scholarships.—The Board of Trustees offers annually thirty-four scholarships to graduates of accredited high schools in the following Washington Metropolitan areas: District of Columbia; Fairfax-Falls Church; Alexandria City; Montgomery, Prince Georges, and Arlington counties. One of these scholarships, designated as the *Amos Kendall Scholarship*, was established in 1869 by the Honorable Amos Kendall.

These scholarships are awarded to students who intend to enter the lower division

* This scholarship is renewable and is, therefore, not available each year for award to an incoming freshman.

of Columbian College of Arts and Sciences and complete a Bachelor's program at this University.

The award covers full tuition for four academic years (excluding summer work and special fees). To retain a high school scholarship, an average of *B* and a satisfactory standard of deportment must be maintained.

Nominations are made by principals and counselors of participating high schools. Inquiries should be addressed to the high school counselor.

Debate Scholarship.—Offered annually to a high school senior who intends to enter the lower division of Columbian College of Arts and Sciences and complete a Bachelor's program at this University.

The award covers full tuition for four academic years (excluding summer work and special fees), provided the holder maintains a *B* average and participates in the official University debate activities.

The scholarship is awarded on the basis of (1) participation in the Annual George Washington University High School Discussion Conference and (2) participation in the Annual George Washington University High School Debate Tournament. Promising high school seniors in and outside the Washington Metropolitan Area, who have demonstrated outstanding ability in interscholastic speech activities, will also be eligible for consideration.

Inquiries should be directed to the Department of Speech.

Levin M. Powell Scholarships (1886).—Full-tuition scholarships, established by bequest, are available annually to young men wishing to prepare for entrance into the United States Naval Academy.

For Students With Established Academic Records at This University

Applicants for these scholarships must have completed one semester of work (15 hours minimum) and maintained a *B* (3.0) average at this University.

American Foundation for Pharmaceutical Education Scholarship (1950).—Provides annual scholarship aid to a fourth- or fifth-year student in the upper quarter of his class in the School of Pharmacy.

American Society of Women Accountants Scholarship (1953).—Established by the District of Columbia Chapter to provide a partial scholarship for a worthy sophomore, junior, senior, or graduate woman majoring in accounting.

Byron Andrews Scholarship (1920).—A partial scholarship established by Bell Fisk Andrews in memory of her husband. Available to "ambitious and needy students, who desire to pursue courses in English, Latin, journalism, history, literature, or political science".

Anna Bartsch Hospital Intern Scholarship (1946).—A partial scholarship established by Dr. Anna Bartsch-Dunne as a memorial to her mother. Awarded to a woman intern in the University Hospital.

Anna Bartsch Medical Student Scholarship (1946).—A $500 scholarship established by Dr. Anna Bartsch-Dunne, as a memorial to her mother. Awarded to a woman in the School of Medicine, "of outstanding scholarship, character, and promise, who intends to make the practice of medicine her life profession".

Everett Lamont Bradley Scholarship (1954).—A partial scholarship, by bequest of Alice R. H. Bradley in memory of her son, for a student in the School of Medicine.

Frederick Albert and Alma Hand Britten Scholarships (1959).—Bequest of Alma Hand Britten for scholarship aid to needy full-time graduate or undergraduate students in the School of Engineering, who would not otherwise be able to pursue such

professional study. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean of the School of Engineering.

Emma K. Carr Scholarships (1932).—Fourteen partial scholarships are available to "young men (of the white race) for undergraduate or postgraduate work, considering character, capacity, and need".

Henry Harding Carter Scholarship (1896).—A $500 scholarship established by Maria M. Carter in memory of her husband to aid a deserving student who is preparing for the civil engineering profession.

Maria M. Carter Scholarship (1871).—Provides tuition aid to a young man.

Colortone Graphic Arts and Publications Scholarship (1961).—An annual $500 scholarship established by Colortone Press for a senior majoring in Journalism.

Mary Covington Memorial Scholarship (1961).—Established by Mary S. English in memory of her aunt, Mary Covington, LL.B. 1922, provides tuition aid to a deserving evening student in the Law School on the basis of scholastic achievement in the first-year course.

Daughters of the American Revolution Scholarship (1952).—A $500 scholarship established by the District of Columbia Chapter. Available to junior and senior students, preferably women, who are descendants of patriots of the American Revolution.

Isaac Davis Scholarship (1869).—Nominations for this tuition aid may be made "by the founder or his eldest lineal descendant". In case no such nomination is made, the scholarship is to be awarded by the University.

District of Columbia Pharmaceutical Association Women's Auxiliary Scholarship (1960).—Provides an annual partial scholarship to a woman who is enrolled in the School of Pharmacy or who has completed the pre-pharmacy requirement at this University or another institution. Inquiries should be directed to the Dean, School of Pharmacy.

Charles Worthington Dorsey Memorial Scholarship (1947).—Memorial to Charles Worthington Dorsey, Bachelor of Laws, '81, Master of Laws, '82. A full-tuition scholarship for the course leading to the degree of Bachelor of Laws, awarded to a needy and promising graduate of this University with a Bachelor of Arts or equivalent degree. The scholarship is awarded ordinarily once every three years.

Henry Parsons Erwin Scholarship (1955).—Established by Helen B. Erwin as a memorial to her husband, a former Trustee of the University. A partial scholarship for a student in Engineering.

Robert Farnham Scholarship (1871).—Established by Mrs. Robert Farnham. Tuition aid for a student in Columbian College of Arts and Sciences.

Esther Brigham Fisher Scholarship (1951).—Bequest for tuition aid.

Georgetown Business and Professional Woman's Club Scholarship (1958).—A partial scholarship for a woman student in the field of science.

Mildred Green Memorial Scholarship Fund (1959).—Established by Alpha Theta Chapter of Pi Lambda Theta, provides annual tuition aid for a student in the School of Education, upon the recommendation of the donor.

Anna Spicker Hampel Scholarship (1949).—Established by Evelyn Hampel Young in memory of her mother, provides tuition aid for a young married woman in the School of Education or Columbian College of Arts and Sciences.

Elma Lewis Harvey Scholarship (1921).—A partial scholarship established by Emma Elizabeth Harvey in memory of her daughter. Awarded every four years, or as often as vacant, to a young woman in Columbian College of Arts and Sciences of

the Protestant faith and the Caucasian race, selected for scholarship and moral qualifications.

Hazelton Scholarship (1950).—An annual partial scholarship, by bequest of Lillie S. Hazelton, "for the use and assistance of needy and worthy students."

Kappa Alpha Theta Scholarship (1950).—A $500 scholarship established by the Washington alumnae for the training of a clinician in speech correction.

Kappa Kappa Gamma Scholarship (1959).—An annual $500 scholarship established by the Washington alumnae for a student planning to follow the profession of speech correction.

Kappa Psi Scholarship (1952).—An annual partial scholarship for a student in the School of Pharmacy, established by Gamma Tau Chapter and the District of Columbia Graduate Chapter of Kappa Psi Pharmaceutical Fraternity.

Law School Scholarships.—Full-tuition scholarships available to second- and third-year full-time students with averages between 75 and 100. Application should be made to the Dean of the Law School prior to July 1. Scholarships are awarded after spring-semester grades are reported.

Eugene and Agnes E. Meyer Scholarships (1952).—A scholarship fund of $3,500, "to assist promising students or applicants in meeting the costs of furthering their education, with preferential consideration to children of persons who are employed in public service, including service in the armed forces or the judiciary."

A. Morehouse Scholarship (1861).—Tuition aid for an undergraduate "intending to enter the Christian ministry."

Newspaper Scholarships.—One scholarship is available each year to a candidate recommended by each of the following newspapers: *The Washington Daily News*, *The Washington Post*, and *The Evening Star*. The holder must be an employee of the newspaper. These scholarships are valid for four academic years, provided the holder continues in the employ and is recommended by the newspaper, and maintains a satisfactory academic record and a high standard of deportment. They cover tuition but do not include any special fees.

Paul Pearson Scholarship (1940).—Bequest "to be known as the Dr. Paul Pearson award", for tuition aid to a student in the School of Pharmacy.

Phi Delta Delta Scholarships (1959).—Zeta Chapter of Phi Delta Delta Legal Fraternity (International), provides tuition aid to a woman student in the second year of the Law School, who excelled in scholastic achievement and service to the Law School in her first year.

Phi Delta Gamma Scholarship (1956).—An annual partial scholarship established by Beta Chapter for a woman candidate for an advanced degree.

Lula M. Shepard Scholarships (1946).—By bequest, two partial scholarships for "worthy Protestant students" wishing to enroll in the International Affairs program of the School of Government, Business, and International Affairs.

David Spencer Scholarship (1918).—A partial scholarship established by Louisa J. Spencer. Available under certain restrictions.

David Perry Steinman Memorial Scholarship Fund (1960).—Established by friends and classmates. Awarded annually to a sophomore in the School of Medicine on the basis of need and academic performance.

Mary Lowell Stone Scholarship (1893).—A partial scholarship available to a woman student of science in Columbian College of Arts and Sciences.

Charles Clinton Swisher Scholarships (1941).—Scholarships of $500 and $300, respectively, by bequest of Professor Swisher. Available under certain conditions, to students of medieval history.

Tau Kappa Epsilon Scholarship (1959).—Established by alumni of the Metropolitan Washington, Virginia, and Maryland areas for annual tuition aid to a member of Tau Kappa Epsilon. If there is no eligible member from the fraternity, the award may be made at the discretion of the Scholarship Committee.

Travelers' Auxiliary, D. C., Pharmaceutical Association Scholarship (1962).—An annual partial scholarship available to a student enrolled in the School of Pharmacy or a student who has completed the pre-pharmacy requirements at this University or another institution.

University Hospital Scholarships in Medical Technology.—Ten scholarships are available, each to cover the cost of 24 semester hours of the 30 in the last year of the curriculum leading to the degree of Bachelor of Science in Medical Technology. Inquiries should be directed to the Department of Pathology, The George Washington University Hospital.

William Walker Scholarship (1824).—Annual tuition aid for an undergraduate intending to enter the Christian ministry.

Barbara G. Wendt Scholarship (1961).—Established by the Presidential Chapter of the National Secretaries Association (International), of Washington, D. C., in memory of a former member. Annual tuition aid for a student in Secretarial Studies.

John Withington Scholarship (1830).—A partial scholarship established by the New York Baptist Theological Seminary.

Ellen Woodhull Scholarship (1919).—Tuition aid for a student in Columbian College of Arts and Sciences.

Zonta Club Scholarship (1950).—An annual partial scholarship for a woman who is a junior, senior, or graduate student with special interest in a professional or business career.

The Columbian Women Scholarship Funds

The Columbian Women Scholarships are awarded to women students on the basis of financial need and scholastic attainment. Applications for these scholarships should be addressed to the Chairman, Columbian Women Scholarships, care of the Alumni Office, The George Washington University, Washington 6, D. C., not later than May 15 for the fall semester, and January 1 for the spring semester. Scholarship aid is awarded from income of the following endowments:

Nellie Maynard Knapp Scholarship Fund (1915).—A fund of $5,000 for tuition aid established in memory of a former president.

Founders of Columbian Women Scholarship Fund (1920).—A fund of $5,000 for tuition aid.

Lillian Young Herron Scholarship Fund (1925).—A fund of $5,000 for tuition aid, named in 1930 in memory of a former president.

Elizabeth V. Brown Scholarship Fund (1925).—A memorial fund of $1,200 for tuition aid, established by the College Women's Club of Washington, D. C., and restricted to the School of Education.

College Women's Scholarship Fund (1926).—A $500 gift for tuition aid established by the College Women's Club of Washington, D. C.

Lewes D. and Myrtie H. Wilson Memorial Scholarship Fund (1926).—A fund of $1,000 for tuition aid established by Elizabeth Wilson as a memorial to her parents and restricted to the School of Medicine.

Grace Ross Chamberlin Scholarship Fund (1932).—A fund of $2,300 for tuition aid in memory of a former president.

Janet McWilliams Scholarship Fund (1954).—A $1,000 fund for tuition aid, by bequest of a former president.

Rose Lees Hardy Foundation Scholarship Fund (1957).—A fund of $2,000 for tuition aid established by an alumna of the University.

Victoria Briggs Scholarship Fund (1959).—A $500 fund for tuition aid, by bequest of Victoria Briggs Turner.

Columbian Women Members' Scholarship Fund (1961).—A $1,000 fund for a woman student in the University.

Arline Hughes Dufour Scholarship Fund (1961).—A $5.000 fund for tuition aid to a woman student.

PRIZES

Alpha Chi Sigma Prizes.—A *Handbook on Chemistry and Physics* awarded annually by Alpha Pi Chapter to each of three students who carry at least 18 semester hours during the freshman year and attain the highest averages in freshman chemistry.

The name and year of graduation of the student who has attained the highest quality-point index in courses in chemistry is inscribed on a bronze plaque. The winner must have had at least 16 hours in chemistry including the final semester at this University.

Alpha Delta Pi Prize.—Offered annually by Alpha Pi Chapter to the woman in the junior class with the most outstanding record in scholarship, extracurricular activities, and service to the University.

Alpha Kappa Psi Prize.—A key, awarded annually by Beta Mu Chapter to the male student who has completed 90 semester hours at this University and attained the highest average grade in economics, business administration, public accounting, public finance, and foreign commerce. The name of the winner and the year of the award is engraved on a plaque in the office of the Dean of the School of Government, Business, and International Affairs.

Alpha Zeta Omega Prize.—A copy of *The United States Dispensatory* is offered annually by the Ladies' Auxiliary, Pi Chapter, to the student who has completed at least 15 semester hours in the School of Pharmacy and attained the highest average in his courses.

American Institute of Chemists Prize.—A medal and a one-year subscription to *The Chemist* awarded annually to the graduating student, majoring in chemistry, who excels in scholarship, integrity, and leadership.

American Pharmaceutical Association Prize.—The City of Washington Branch offers annually an award to be applied toward an active membership in the American Pharmaceutical Association to the student completing the next-to-last year in the School of Pharmacy who has maintained a high scholastic average and contributed most to the student activities of the School.

Norman B. Ames Memorial Award.—Established by many friends of Dr. Ames and awarded annually to a member of the graduating class of the School of Engineering whose class standing is in the upper 25th percentile and who has an outstanding record for participation in extracurricular activities of the University.

Byrne Thurtell Burns Memorial Prize.—Awarded to the senior majoring in chemistry who shows the greatest proficiency in organic chemistry, as evidenced by a comprehensive examination, and who possesses such qualifications of mind, character, and personality as to give promise of future achievement.

Martin L. Cannon Memorial Prize.—A copy of *The United States Dispensatory* offered annually by Pi Chapter of Alpha Zeta Omega Pharmaceutical Fraternity to the student completing the pre-Pharmacy curriculum with the highest academic average.

Wilbur J. Carr Prize.—This prize of $200 was established in 1962 by Edith K. Carr, an Honorary Trustee of the University, in memory of her distinguished husband, who was graduated from the School of Comparative Jurisprudence and Diplomacy in 1899. It will be awarded annually to that man in the graduating class of The George Washington University who has demonstrated outstanding ability in his study of international affairs and who has given evidence of possessing in marked degree the qualities which produce the good citizen and the dedicated public servant.

Chi Omega Prize.—Awarded annually by Phi Alpha Chapter to the woman in the graduating class with the highest record in the following social sciences: economics, sociology, political science, and history; combined with general excellence.

The Columbian Women Prize.—Awarded to the senior woman who in her undergraduate life has most nearly fulfilled the objectives of Columbian Women.

John Henry Cowles Prizes.—A first prize of $100 and a second prize of $75, established by John H. Cowles, Grand Commander of the Supreme Council of Thirty-third Degree (Mother Council of the World) of the Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction of the United States of America. Awarded annually to the two seniors in the School of Government, Business, and International Affairs with the highest academic averages.

DeWitt Clinton Croissant Prize.—Awarded annually to the undergraduate student enrolled in a course in drama or active in University dramatics who submits to the English Department the best essay on drama or the theater.

E. K. Cutter Prize.—Established by Marion Kendall Cutter "for excellence in the study of English." Awarded to the member of the graduating class whose record in English, combined with general excellence, shows most marked aptitude for and attainment in English studies.

Isaac Davis Prizes.—Awarded annually to the three seniors who made the greatest progress in public speaking while enrolled in the University. Awards are to be determined by a public-speaking contest in which the participants deliver original orations. Only members of the senior class who are candidates for the degree of Bachelor of Arts or Bachelor of Science are eligible to compete.

Delta Gamma Prize.—Awarded annually by Beta Rho Chapter to the woman who, at the end of her freshman year, has the most outstanding record in scholarship, extracurricular activities, and service to the University.

Delta Zeta Prize.—Awarded annually to the student maintaining the highest average in Biology 1–2.

Elton Prize.—Established by the Reverend Romeo Elton, of Exeter, England, and awarded annually to the student with the highest average in the most advanced course in the Greek language and literature.

School of Engineering Distinguished Scholar.—A certificate awarded annually by the Faculty of the School of Engineering to the senior who graduates with the highest scholastic standing. The student's name is engraved on a plaque displayed in Tompkins Hall.

Jesse Frederick Essary Prize in Journalism.—A prize of $200 established by Helen Essary Murphy and awarded annually to a student who has given promise of sound citizenship and who submits the best printed and published evidence of ability in "forthright reporting" and good journalistic writing, in a student publication or elsewhere.

Joshua Evans III Prize in Political and Social Sciences.—A memorial prize of $100 "established by friends because of an outstanding life." Awarded annually to

that man in the graduating class who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows."

Willie E. Fitch Prize.—Established by James E. Fitch in memory of his son. Awarded annually to a senior student for the best examination in chemistry.

Allie S. Freed Prize.—Awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine.

Charles Glover Prize.—Established by Charles Carroll Glover, Jr., a Trustee of the University, in memory of his great-grandfather, an illustrious member of the bar of the District of Columbia. Consists of selected law books. Awarded annually to the student in the Law School who has attained the highest average grade in the third-year, full-time course.

Alice Douglas Goddard Prize.—A memorial established by Frederick Joseph Goddard, of Georgetown, D. C. Awarded annually to the upper-division student making the highest average in American literature.

Edward Carrington Goddard Prize.—Established by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C., in memory of Edward Carrington Goddard, class of '81. Awarded to the junior or senior student making the highest average in the French language and literature.

James Douglas Goddard Prize.—Established by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C., in memory of James Douglas Goddard, class of '01. Awarded to the senior student making the highest average in pharmacy.

Morgan Richardson Goddard.—A memorial established by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C. Awarded to the junior or senior student making the highest average in the following fields: economics, business administration, foreign commerce, and public accounting.

Alec Horwitz Prize.—A prize of $100 awarded annually to a senior in the School of Medicine who has demonstrated exceptional proficiency in the field of surgery.

Gardiner G. Hubbard Memorial Prize in United States History.—Established by Gertrude M. Hubbard in memory of her husband and awarded annually to that member of the graduating class majoring in history who has maintained the highest standing in courses in United States history.

Kappa Beta Pi Prize.—A copy of Blackstone's *Commentaries* or a legal dictionary awarded annually by Eta Alumnae Chapter to the woman law student who attains the highest average for the freshman year.

Kappa Kappa Gamma Prize.—Awarded annually to the full-time freshman who achieves the best record in Biology 1-2.

John Bell Larner Prize.—By bequest, a medal is awarded annually to the member of the graduating class in the Law School who attains the highest average grade in the entire course for the degree of Bachelor of Laws or Juris Doctor.

Huron W. Lawson Prize.—A prize of $100 established by Mrs. Lawson in memory of her husband, who was a distinguished member of the Medical Staff of the University, is presented annually to a member of the graduating class of the School of Medicine who has demonstrated exceptional proficiency in the field of Obstetrics and Gynecology.

Lawyers Title Award.—A $100 prize established by the Lawyers Title Insurance Corporation is awarded annually to a graduating senior for excellence in the law of real property.

Martin Mahler Prize in Materials Testing.—A one-year membership in the American Society for Testing Materials awarded to the upper division or graduate student in engineering who submits the best reports on tests in the Materials Laboratories course with reference given to prestressed concrete tests.

Mortar Board Prize.—A silver cup awarded annually to the woman student in the sophomore class having an average of *B* or higher and the most outstanding record in activities.

Julius S. Neviaser Prize in Orthopedic Surgery.—A prize of $100 awarded annually to the student in the junior class of the School of Medicine who scores the highest grade in a written examination in Orthopedics.

Omicron Delta Kappa Prize.—A plaque awarded annually by Alpha Delta Circle to "that member of the senior class who throughout his course has done the most constructive work in the furtherance and upbuilding of the University student activities."

John Ordronaux Prizes.—By bequest, $150 awarded annually to the member of the graduating class in the School of Medicine who has the highest scholastic standing. In the Law School $75 is awarded annually to the student who has attained the highest average grade in the first-year, full-time course; and $75 to the student who has attained the highest average grade in the second-year, full-time course.

Panhellenic Association of Washington, D. C., Prize.—A trophy to be awarded to the Panhellenic Sorority maintaining the highest yearly scholastic average at the University for the previous year.

Phi Delta Kappa Prize.—Awarded annually by Beta Gamma Chapter to the outstanding senior man in the teacher education program in the School of Education.

Phi Eta Sigma Prize.—A choice book selected from the field of the recipient's major, awarded annually by The George Washington University Chapter to the male student attaining the highest scholastic average in his first full semester of work. The winner's name is engraved on a plaque in the Office of the Dean of Columbian College of Arts and Sciences.

Pi Beta Phi Prize.—Awarded annually by the District of Columbia Alpha Chapter to the woman member of the senior class who throughout her college course has done the most constructive work in the promotion of student activities among the women of the University.

Pi Lambda Theta Prize.—Awarded annually by Alpha Theta Chapter to the outstanding senior woman in the teacher education program in the School of Education.

Psi Chi Prizes.—Two prizes awarded annually to the best undergraduate student in Experimental Psychology and to the graduate student submitting the best Master's thesis in Psychology by The George Washington University Chapter.

Ruggles Prize.—Established by Professor William Ruggles, awarded annually to a candidate for a Bachelor's degree for excellence in mathematics.

Sigma Kappa Prize.—Awarded annually by Zeta Chapter to the student with the highest grade in the final examination in General Chemistry.

Sigma Tau Prize.—A medal awarded annually by the XI Chapter to the freshman in the School of Engineering who maintains the highest scholastic standing in the work of the entire year.

Society of Colonial Wars in the District of Columbia Prize.—A gold medal awarded to a candidate for a graduate degree who, in the judgment of the Faculty of the Department of History, submits a thesis or dissertation demonstrating excellence in historical research in American Colonial history. The University reserves the

right to withhold the award if no thesis or dissertation attaining the required degree of excellence is submitted.

Staughton Prize.—Established by the Reverend Romeo Elton and awarded annually to the student making the best record in the most advanced course in the Latin language and literature.

James MacBride Sterrett, Jr., Prize.—Established by Professor Sterrett in memory of his son, consists of the *American Institute of Physics Handbook* awarded annually to the student who obtains the highest average in Physics 14, 15, and 16.

Charles Clinton Swisher Historical Club Prize.—A prize of $100 established by the Charles Clinton Swisher Historical Club and augmented in 1941 by the bequest of Professor Swisher, is awarded annually to the student who submits the best essay covering some phase of medieval history.

Theta Tau Activities Plaque.—A plaque awarded annually by Gamma Beta Chapter to the senior in the School of Engineering with the most outstanding record in activities for the entire period of his attendance.

Thomas F. Walsh Prize.—A prize of $150 awarded annually to the student who submits the best essay in Irish history.

Washington Personnel Association Prize.—Awarded annually to an outstanding graduating senior in business administration who shows general excellence in studies, demonstrates superiority in one or more courses in personnel administration, and shows qualities of leadership or promise through extra-scholastic activities.

Alexander Wilbourne Weddell Prize.—A prize of $350 established by Virginia Chase Weddell in memory of her husband. Awarded annually to a candidate for a degree who writes the best essay on the subject of "the promotion of peace among the nations of the world." The prize essays shall become the property of the University and shall not be printed or published without the written consent of the University. The University reserves the right to withhold the award if no essay attaining the required degree of excellence is submitted.

Military Awards

Society of American Military Engineers Gold Medal.—Awarded annually to selected Air Force ROTC cadets in the last two years of the engineering course.

National Defense Transportation Association Award.—Awarded to the outstanding senior graduate who qualifies for the Air Force Specialty of Air Transportation Officer or Surface Transportation Officer, in recognition of leadership qualities, academic standing, aptitude for military service, and meritorious achievement in furthering the aims and objectives of the Association in the promotion of preparedness for national defense.

Armed Forces Communications and Electronics Association Gold Medal.—Awarded annually to senior Air Force ROTC cadets majoring in Electrical Engineering for military and academic or nonacademic leadership.

Air Force Association Silver ROTC Medal.—Awarded annually to the outstanding cadet among those who have completed Summer Training and intend to apply for flying training.

Reserve Officers' Association Medals.—Gold, silver, and bronze medals awarded annually to those cadets enrolled in Air Science 101–2, 51 and 52, 21 and 22, respectively, who receive the highest grades for the current year in the leadership and acadmic phases of the Air Force ROTC course.

Chicago Tribune Gold ROTC Medal.—Awarded each semester to the cadet enrolled in Air Science 151–52 who has contributed most effectively to the Air Force ROTC program by leadership and scholastic excellence.

Chicago Tribune Silver ROTC Medal.—Awarded each semester to the cadet in ROTC Basic Course who has demonstrated outstanding leadership potential and maintained excellent scholastic standing.

Sons of the American Revolution ROTC Medal.—Awarded annually by the District of Columbia Society to the freshman of each Air Force ROTC flight who excels in qualities of good citizenship and meets the requirements prescribed by the donor.

Unit Leadership Trophy.—A silver trophy offered by Walter G. Bryte, Jr., Colonel, USAF (Retired), first Professor of Air Science at this University. Awarded annually to the flight judged best in a competitive review and inspection. The Cadet Commander of this flight is presented a set of engraved Second Lieutenant's insignia.

The Colonial Cadet Rifle Trophy.—Offered by Master Sergeant Jerome Gleason, USAF, first coach of the Air Force ROTC Rifle Team at this University. Awarded to the outstanding member of the rifle team.

Arnold Air Society Scroll.—Offered by the Carl Spaatz Squadron. Awarded annually to the outstanding cadet completing the basic course with a cumulative average of *B* or better in Air Force ROTC courses.

Pershing Rifles Gold, Silver, and Bronze Achievement Medals.—Awarded annually by the National Headquarters to outstanding Pershing Riflemen.

Republic Aviation Award.—An engraved identification bracelet offered by the Republic Aviation Corporation. Awarded annually to the cadet enrolled in Air Science 101–2 who, in competition, makes the most effective verbal presentation on the Air Power theme.

The Convair Award.—A Convair miniature airplane offered by the Consolidated Vultee Aircraft Corporation. Awarded annually to the cadet enrolled in Air Science 51 and 52 who achieves the highest cumulative grade in the basic course and who applies for flight training.

Reserve Officers' Association Junior Memberships.—Five junior memberships offered by the Reserve Officers' Association of the District of Columbia. Awarded annually to the five cadets with the highest grades in Air Science 101–2.

National Rifle Association Club Champion Medal.—Awarded to a sophomore, junior, or senior member of the Rifle Team outstanding in marksmanship, participation in team matches, and contribution to the effectiveness of the team.

National Rifle Association Qualification Medals.—Awarded annually to members of the Rifle Team qualifying as Expert, Sharpshooter, or Marksman in indoor rifle firing.

Air Force ROTC Rifle Team Awards.—Trophies, plaques, and medals awarded annually to Air Force ROTC Rifle Teams through successful competition in the following:

The Air Force ROTC Liaison Area Championship Matches
The Army and Area Intercollegiate and Interscholastic Matches
The Secretary of the Air Force ROTC Rifle Match
The William Randolph Hearst National ROTC Rifle Matches.

FINANCIAL AID

Student Employment

Graduate and undergraduate student assistantships are available in several departments of the University. Application should be made to the chairman of the department of instruction concerned.

The Placement Office maintains a registry of positions available in many fields of work and refers qualified applicants for consideration.

Loan Funds

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Students in the schools of Law, Medicine, and Pharmacy should direct inquiries to and file applications with their respective deans. All other inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of the University have made available a fund for short-term loans to students to provide for partial payment of tuition. Application should be made three days prior to the dates on which tuition installments are due.

Joseph H. Himes Loan Fund.—A fund of $17,779 is available for loans to students in the School of Medicine.

Home Economics Loan Fund.—A fund of $382 given by the D. C. Home Economics Association, is available for loans to senior girls majoring in Home Economics.

Kellogg Foundation Hospital Administration Loan Fund.—A fund of $10,000 for loans to full-time graduate students in hospital administration.

Kellogg Medical School Loan Fund.—A fund of $21,179, established by W. K. Kellogg Foundation in Battle Creek, Michigan, for loans to students in the School of Medicine.

Law Association Loan Fund.—A fund of $2,682, established by the George Washington Law Association, for loans to students in the Law School requiring less than 30 semester hours credit toward the degrees of Bachelor of Laws or Juris Doctor.

School of Medicine Loan Fund.—A fund of $19,205, contributed by medical students, is available for loans to students in the School of Medicine.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given applicants who express a wish to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than July first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

Pfizer Medical School Loan Fund.—A fund of $1,071, established by Chas. Pfizer & Co., Inc., for loans to students in the School of Medicine.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund.—A fund of $2,234, established by the family and friends of Benjamin Schoenfeld, for loans to pharmacy students.

Sutherland Medical School Loan Fund.—A fund of $1,639, established by Rose L. Sutherland, for loans to students in the School of Medicine.

A list of banks and commercial finance firms offering various types of tuition payment plans is available through the Office of the Treasurer.

REGULATIONS

A student enrolled in the University is required to conform to the following University regulations and to comply with the rules and regulations of the college, school, or division in which he is registered.

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. Regular attendance is required. A student may be dropped from any course for undue absence.

A student suspended for any cause may not attend classes during the period of suspension.

SCHOLARSHIP REQUIREMENTS

A student who fails to maintain the scholarship requirements of the college, school, or division in which he is registered may be dismissed from the University.

Grades

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors.

Undergraduate.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the dean's council of the college, school, or division concerned. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. A student may not repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

Graduate.—For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete).

For the grading systems of the School of Medicine, the Law School, and the Graduate School of Public Law, see the explanations in the announcements of those schools.

The Quality-Point Index

Undergraduate.—Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete record in this University.

Quality points are computed from grades as follows: *A*, four points; *B*, three

points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not superseded by a proper grade within the allotted time, it is computed as zero quality points. Grades in courses taken at another institution are not considered in computing the quality-point index.

Examinations

Examinations are scheduled at the end of each semester or at the completion of the course.

Academic Dishonesty

Evidence of dishonesty on the part of any student will result in his suspension from the University upon the recommendation of the appropriate dean's council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for all courses in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in computation of the quality-point index.

If a student suspended because of academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the quality-point index.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the dean of the college, school, or division in which the student is registered. Permission to withdraw from the University will not be granted a student who does not have a clear financial record. (See "Fees and Financial Regulations", pages 20 and 23.)

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases. (See pages 98–99 for regulations governing withdrawal from the School of Engineering.)

All charges for courses dropped without the approval of the dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

A student may not withdraw from either the basic course or the advanced course of the Air Force ROTC without the approval of the President of the University.

CHANGES IN PROGRAM OF STUDIES

Changes within a College, School, or Division.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the dean of the college, school, or division in which he is registered.

Change from one section to another of the same course may be made with the approval of the dean and the department concerned.

* The University work week is Monday through Friday, inclusive.

Change from one major subject to another within the same college or school may be made with the approval of the dean. All requirements of the course of study to which the change is made must be met.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Except in cases of normal progression from the lower division of Columbian College of Arts and Sciences in a regular baccalaureate program, application for transfer must be made to the Director of Admissions on the form provided by his office.

Students wishing to transfer from the Division of University Students to a degree granting college or school of the University should note that a maximum of 45 semester hours will be accepted in transfer.

Students transferring within the University are advised to study carefully the graduation requirements on pages 42 and 43 and to note that in all undergraduate divisions, except the lower division of Columbian College of Arts and Sciences and the College of General Studies, 30 semester hours, including *at least 12 semester hours* in the major field, must be completed *in residence* in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill. (For residence requirements in the lower division of Columbian College of Arts and Sciences, see page 51. For information concerning the College of General Studies, see separate bulletin.

CREDIT

Credit is given only after registration for a course and satisfactory completion of the required work, or upon the assignment of advanced standing in accordance with the regulations of the several colleges, schools, and divisions.

On request the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

Summer School Credit

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the dean of his college or school. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

PHYSICAL EDUCATION REQUIREMENTS

Freshman and sophomore students in Columbian College of Arts and Sciences (except those enrolled in the Physical Education for men curriculum) are required to take Physical Education 1–2 and 11–12 unless they are registered for less than 9

semester hours or unless regular employment during the day makes it necessary to take all classes during the evening hours. Air Force ROTC cadets and a limited number of freshman and sophomore women may substitute Air Science 1–2 and 11–12 for the physical education requirement.

Any other exemptions will be granted only upon written petition which has been recommended by the physical education department concerned and approved by the dean of the college or school in which the student is registered.

Students exempt from the physical education requirement will be required to substitute four hours of elective.

A student entering the University with advanced standing is not exempt from the physical education requirement unless he has satisfactorily met the requirement elsewhere.

The required medical and physical examinations, as specified by the departments of physical education, will be arranged at the time of registration.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirements of the college or school in which he is registered, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Scholarship.—In all undergraduate divisions of the University the scholarship requirement for graduation is a quality-point index of at least 2.00.

The graduate student must meet the scholarship requirements for the particular degree for which he is registered.

Curriculum.—Minimum curriculum requirements for each degree are stated under the college or school offering work in preparation for the degree. (For Air Force ROTC graduation requirements see the Department of Air Science.)

Residence.—Unless otherwise specified, in all undergraduate divisions of the University, *a minimum of 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the school or college from which the degree is sought.* This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the dean of the college or school concerned to pursue work elsewhere, the work of the senior or final year must be completed in residence.

The graduate student must meet the residence requirements for the particular degree for which he is registered.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status by paying the appropriate fee, see page 21.

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

Graduate Record Examination.—All candidates for Bachelor's degrees in Columbian College of Arts and Sciences; the School of Engineering; the School of Government, Business, and International Affairs; and the College of General Studies are required to take two parts of the Graduate Record Examination in the University's institutional testing program. The examinations are conducted by the University twice a year: the Fall Testing Session (December 8, 1962) for seniors graduating in February, and the Spring Session (April 6, 1963) for those graduating in June. Students expecting to complete degree requirements during the summer sessions should take the examination in the Spring Session. Dates of the examinations are announced in the *Schedule of Classes.*

Each senior required to take the Graduate Record Examination must register for it in the office of his dean when he registers for his final regular semester of study (excluding summer sessions). A $10 examination fee is payable at the time of registration.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

National Teacher Examinations.—All candidates for the Bachelor of Arts degree in the School of Education are required to take the National Teacher Examinations at one of the three regularly scheduled administrations conducted in February, July, and October. Candidates expecting to graduate in June should take the examinations the previous February. Those expecting to graduate in February should take the examinations the previous July or October.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. A copy of test scores must be forwarded to the School of Education.

Each senior required to take the National Teacher Examinations must register for them in the office of the Dean at least thirty days prior to the date of the administration of the examinations. Details concerning time, place, registration, and fees may be obtained in the Office of the School of Education.

See the announcements of the various schools and colleges in this CATALOGUE for a description of the tests required.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for a degree, must be presented in its final form to the dean of the college or school concerned no later than the date specified in the University calendar. Three complete copies of each are required. It is the responsibility of the candidate for a graduate degree to obtain from his dean a printed copy of the regulations governing the styling and reproduction of theses and dissertations, which are rigidly enforced.

Accepted theses or dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the appropriate dean.

Presence at Graduation.—Presence at the graduation exercises is required of the candidate, unless the work for the degree was completed during the summer term or written application for graduation *in absentia* has been approved by the Dean.

Honors

With distinction.—In all undergraduate divisions of the University the degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

In the School of Medicine and the Law School, degrees may be conferred "with distinction", at the discretion of the Faculty, on those students who attain an average of *A* on all work taken for the degrees.

Special honors.—Special honors may be awarded by the Faculty to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.

3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.

4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101 and 102 with an academic standing among the upper third of the students enrolled therein; (2) has an accumulative academic average of *B* or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself by demonstrated leadership through participation in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" is authorized to wear a "Distinguished Cadet" badge above the right breast pocket of the uniform. He may submit an application for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate."

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been designated a "Distinguished Air Force ROTC Cadet" and maintained the standards required of a "Distinguished Air Force ROTC Cadet" during the period between designation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for a Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he made application, will be considered for a regular commission in the United States Air Force.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

The Colleges, Schools, and Divisions

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

THE FACULTY AND STAFF OF INSTRUCTION*

C. D. Linton, *Dean of Columbian College of Arts and Sciences;* G. M. Koehl, *Associate Dean of Columbian College of Arts and Sciences;* R. W. Stephens, *Assistant Dean of Columbian College of Arts and Sciences;* W. L. Turner, *Assistant Dean in Columbian College of Arts and Sciences;* J. C. King, *Assistant Dean in Columbian College of Arts and Sciences*

Professors F. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns†, Elizabeth Burtner, R. D. Campbell, J. H. Coberly, C. W. Cole, R. H. Davison, V. J. DeAngelis, Mitchell Dreese‡, D. C. Faith, C. E. Gauss, H. L. Geisert, Wood Gray, A. M. Griffin, R. G. Hanken, I. B. Hansen, G. F. Henigan, Jr., P. H. Highfill, Jr., T. W. Holland, Thelma Hunt, Herbert Jehle, E. H. Johnson, F. E. Johnston, E. L. Kayser, J. W. Kendrick, R. D. Kennedy, D. C. Kline, G. M. Koehl, W. H. Kraus, J. H. Krupa, J. F. Latimer, Helen Lawrence, C. E. Leese, L. P. Leggette, W. K. Legner, R. M. Leonard, C. D. Linton, G. I. Lippitt, T. P. G. Liverman, W. A. MacDonald, H. G. Mandel, G. E. McSpadden, Florence Mears, H. M. Merriman, R. H. Moore, Edith Mortensen, S. C. Munson, W. H. Myers, C. R. Naeser, N. D. Nelson, C. E. Olmstead, R. C. Parlett, T. M. Peery, T. P. Perros, C. W. Pettit, E. M. Renkin, Mary Robbins, Gretchen Rogers, W. F. Sager, R. P. Schlabach, Jr., Wilson Schmidt, E. S. Shepard, J. R. Sizoo, Lewis Slack§, E. L. Stevens, R. B. Stevens, Geza Teleki, I. R. Telford, Kathryn Towne, C. R. Treadwell, F. S. Tupper, B. D. Van Evera, R. C. Vincent, D. S. Watson, N. A. Wiegmann, R. E. Wood, S. N. Wrenn

Professorial Lecturers Gerhard Colm, D. M. Dribin, Michael Fleischer, Samuel Greenhouse, Hans Heymann, Jr., H. F. Hubbard, Margaret Ives, K. C. Kates, Solomon Kullback, W. H. Marlow, F. M. Riddick, L. B. Smith, I. G. Sohn, R. A. Young

Associate Professors F. D. Allan, J. G. Allee, Jr., L. S. Bielski, W. E. Caldwell, G. V. Carroll, John Clayton, W. G. Clubb, W. C. Davis, A. H. Desmond, J. W. Harkness, R. C. Haskett, C. W. Hill, H. H. Hobbs, Rudolph Hugh, Eva Johnson, R. G. Jones, J. M. Kaper *(Research)*, J. C. King, Virginia Kirkbride, H. L. LeBlanc, L. P. Leite, H. R. Ludden, W. L. Marsh, G. E. Mazzeo, Muriel McClanahan, C. Y. Meade, J. N. Mosél, Benjamin Nimer, J. P. Reesing, Jr., J. W. Robb, Carol St. Cyr, R. H. Schlagel, L. E. Schlesinger *(Research)*, William Schmidt, Mildred Shott, J. W. Skinner, B. W. Smith, Henry Solomon *(Research)*, Loretta Stallings, R. W. Stephens, Rafael Supervía, R. B. Thompson, W. L. Turner, C. E. Tuthill, R. D. Walk, R. H. Walker, Jr., H. W. Westermann‖, D. G. White, R. C. Willson, Helen Yakobson

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* The President of the University; the Dean of Faculties; the Dean, Associate Dean, and Assistant Deans of the College; the Registrar of the University; the Director of Admissions of the University; the Professors; Associate Professors; Assistant Professors; and Instructors constitute the Faculty. The listing of Faculty and Staff of Instruction is for the academic year 1961–62.

† On sabbatical leave spring semester 1961–62.

‡ On leave of absence 1961–62.

§ On leave of absence spring semester 1961–62.

‖ On sabbatical leave fall semester 1961–62.

Associate Professorial Lecturers Caroline Adams, Joseph Blum, H. M. Cathey, J. G. Colmen, Edward Hacskaylo, C. D. Kean, Morton Kupperman, H. H. Landon, Jr., Kittie Parker, J. P. Pickard, Herbert Rabin, R. S. Sigafoos, William Spencer

Assistant Professors J. M. Bailey, R. E. Baker, Samuel Baum, J. M. Campbell, J. T. Davis, Margaret Ethier, J. A. Frey, R. E. Gajdusek, P. F. Gallagher, Lyndale George, Lila Ghent *(Research)*, Jacqueline Goodnow *(Research)*, Charles Herber, J. P. Hollinger, Hewitt Kenyon, Carlos Lozano, M. E. Lyon, J. L. Metivier, Jr., Margaret Montzka, G. C. Murray *(Research)*, R. E. Nolan, H. D. Osterle, R. C. Sentz, W. A. Smith, Jeanne Snodgrass, George Steiner, J. G. Sweeney, R. E. Thomas, Nancy Tischler, G. V. Vahouny, Connie Vaughn, R. Z. Vause, Elizabeth Wright, S. S. Yeandle, Jr.

Lecturers E. M. Archer, J. R. Buchheit, W. J. Condell, Jr., F. L. Dennis, DeWitt Fisher, C. E. Forsythe, J. M. Harrison, J. V. Hinkel, Kiril Jaszenko, H. C. Krebs, Richard Lahey, Esther Lawton, C. J. Lindley, Mabel Morris, A. A. Nilles, K. F. Oerlein, C. H. Pfuntner, A. B. Seidman, Jassalee Sickman, C. H. Slayman, Jr., Edith Surrey, J. N. Tevis, J. E. Tompkins, Heinz Warneke, Jane Wickey

Instructors Jane Bauman, L. D. Bothwell, Earl Harbert, P. P. Hill, Chaing-Yao Hsieh, G. P. Huvé, Eulogia Llansa, Elizabeth Neyman, Barbara Raskin, R. C. Rutledge

Associates Janet Johnson, G. S. Landau

COMMITTEES*

LOWER DIVISION

The Dean's Council†

1962: T. P. Perros, R. W. Stephens; 1963: W. E. Caldwell, Florence Mears; 1964: G. E. Mazzeo, Elizabeth Wright

Committee on Admission and Advanced Standing

J. C. King *(Chairman)*, W. G. Clubb, Margaret Montzka, W. A. Smith, R. C. Willson

Committee on Scholarship

W. L. Turner *(Chairman)*, R. G. Hanken, J. C. King, Muriel McClanahan, J. L. Metivier, Jr., Edith Mortensen, R. C. Vincent

Advisory Committee

G. M. Koehl *(Chairman)*, R. E. Baker, C. W. Bliven, J. C. King, J. H. Krupa, Carol St. Cyr, Mildred Shott, Loretta Stallings, H. G. Sutton, Nancy Tischler, W. L. Turner, R. C. Vincent

UPPER AND GRADUATE DIVISIONS

The Dean's Council†

1962: A. H. Desmond, R. C. Vincent; 1963: Gretchen Rogers, W. F. Sager; 1964: R. C. Haskett, C. E. Tuthill

Committee on Admission and Advanced Standing

R. W. Stephens *(Chairman)*, Edith Mortensen *(Secretary)*, C. W. Cole, J. W. Kendrick, W. F. Sager

* The Dean of Columbian College of Arts and Sciences is a member ex officio of all committees.
† Elected by the Faculty.

Committee on the Use of Correct English

R. H. Moore *(Chairman)*, J. G. Allee, Jr., G. F. Henigan, Jr., Muriel McClanahan, R. C. Willson

Committee on Scholarship

Florence Mears *(Chairman)*, W. G. Clubb, H. M. Merriman, J. P. Reesing, Jr., S. N. Wrenn

Committee on Studies

C. D. Linton *(Chairman)*, A. H. Desmond, H. L. LeBlanc, William Schmidt, F. S. Tupper

GENERAL INFORMATION

INTRODUCTORY

Columbian College was founded in 1821. James Monroe, then President of the United States, aided in obtaining the charter from Congress which established "The Columbian College in the District of Columbia" for the "sole and exclusive purpose of educating youth in the English, learned and foreign languages, the liberal arts, sciences and literature." Columbian College became Columbian University in 1873. When Congress authorized changing the name to The George Washington University, the name "Columbian College" was given to the college of liberal arts and sciences. In 1961 the name was changed to Columbian College of Arts and Sciences.

Incoming liberal arts and science freshmen and all transfer students of less than junior class standing are registered in the lower division of Columbian College. The lower division also provides the first two years of the prelegal and premedical programs, the preprofessional work required for admission to the schools of Pharmacy; Education; and Government, Business, and International Affairs; and two-year terminal curricula in Accounting, Home Economics, Physical Sciences, and Secretarial Studies. The lower division is primarily concerned with providing (1) the personal and academic guidance needed by beginning college students and (2) the broad cultural foundations in language and literature, science, and social studies on which major field specialization in the upper division is built.

The upper division of Columbian College offers programs leading to Bachelor's degrees in the liberal arts and sciences; the graduate division offers programs leading to the Master's degrees.

Students beginning the first year of graduate study who plan to work toward the degree of Doctor of Philosophy may be given provisional status in the Graduate Council. However, if the student prefers and if the Dean of the Graduate Council so advises, he may register for a Master's degree in Columbian College of Arts and Sciences during the first year and apply for transfer to the Council upon completion of the Master's work.

The Columbian College Program

The Columbian College program is a contemporary application of the historic liberal arts tradition. Its purpose is to enable the student to develop harmoniously both his particular abilities and his general awareness as a human being. It demands of the student a thorough acquaintance with one major area of learning and at the same time an understanding of how that field of specialization fits into the larger context of the scientific, social, and moral problems which confront modern man. It stresses not merely expertness but that broadly enlightened expertness which encourages its graduates to grow through the years in ability and wisdom.

REGULATIONS

Regulations regarding Admission, Registration, Fees and Finances *are stated on pages 8–23; other University regulations, on pages 39–45.*

Attendance

The student is held responsible for all the work of the course in which he is registered, and all absences must be excused by the instructor in charge before provision is made for the student to make up work missed. Excessive absence in any course will lead to loss of credit in that course, even though other requirements, such as tests, term papers, and examinations, are met.

A student whose absences from any class, whether excused or unexcused, are in excess of one-fourth of the total number of class periods will receive the grade of *F* for the course, except by special ruling of the Dean on recommendation of the instructor.

Use of Correct English

The use of correct English, oral and written, is required in all courses. Any student whose English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean and to the Committee on the Use of Correct English. The Chairman of the Committee may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed by failure to make up any such deficiency in English to the satisfaction of the Committee and the Dean.

Honors

Lower Division Honor Roll.—The name of every lower division student who has a quality-point index of 3.50 or higher on the basis of his complete record at this University is placed on the honor roll and published. To be eligible, the student must have completed no less than 15 semester hours. (A place on the honor roll does not necessarily mean that the student will receive honors upon graduation.)

Dean's List.—The name of every student who makes a quality-point index of 3.50 or higher on a minimum of 15 semester hours of work taken in any one semester is placed on the Dean's List for that semester.

Probation

A student must maintain a quality-point index of at least 2.00. or be placed on probation. He remains on probation as long as his index is below 2.00 or until his probation is removed by the Committee on Scholarship. The student whose average is 2.00 or below for work undertaken during this probationary period is suspended. The student whose over-all quality-point index is still below 2.00 but whose average for work undertaken during the probationary period is above 2.00 may be continued on probation by the Committee on Scholarship.

Suspension

A student whose index falls below 1.50 or who is placed on probation for a third semester, whether successive or after an interval, is suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University he has

so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors file in the Office of the Dean the names of freshman and sophomore students who are doing work of *D* grade or lower. A notice of Warning is sent to the student and a copy filed with the appropriate adviser. A "warning" constitutes notice to the student that he must consult his instructor and adviser at the earliest opportunity.

The foregoing scholarship rules are applied to a student with a limited schedule only when he has undertaken a minimum of 15 semester hours.

Correspondence and Home-study Courses

No credit is given for work done by correspondence or in home-study courses.

CLASSIFICATION OF STUDENTS

A *freshman* is a student who is in the process of completing 32 semester hours, including 18 hours of his curriculum requirements.

A *sophomore* is a student who has completed between 32 and 64 hours, including 18 hours of his curriculum requirements.

A *junior* is a student who has completed between 64 and 94 hours and filed the declaration of his major, approved by his adviser, in the Office of the Dean.

A *senior* is a student who has completed between 94 and 124 hours, including at least 6 hours of second-group work in his major.

A *master in course* is a student who has satisfactorily completed the work for the Bachelor's degree and filed his approved program of study in the Office of the Dean.

THE LOWER DIVISION

Advisory System

Members of the Faculty, selected for their knowledge of freshman-sophomore requirements and student programs, advise students in making up their programs of study for each semester. A separate staff of experienced advisers under the chairmanship of the Dean assists those students who find it difficult to make adjustments to college life because of scholastic or other reasons. Students who are "warned" or who are on probation may be required to consult these advisers at regular intervals. Students are encouraged to consult any member of the Advisory Staff or their instructors about college problems at any time.

Copies of notices of "warning" or probation are sent to the parents or guardians of students on request, and the Dean and members of the Advisory Staff are available for consultation with parents or guardians concerning student problems.

Preprofessional Students.—Preprofessional students who intend to transfer after the sophomore year to the School of Education; the School of Pharmacy; or the School of Government, Business, and International Affairs are registered in the lower division to complete the curriculum requirements specified by each professional school. Such students are assigned special advisers to assist them in planning their programs.

Scholastic-Aptitude Tests

Students admitted to the lower division of Columbian College may be required to take the scholastic-aptitude tests of the University.

Required Placement Examinations

English.—Special placement examinations, required of all entering freshmen, are conducted by the English Department. Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

Foreign Languages.—A standardized placement examination is required of all entering students who wish to continue in college the language begun in high school (French, German, Russian, or Spanish). Upon completion of the examination, assignment is made to the appropriate course.

First- and Second-Group Courses

A freshman or sophomore may not take second-group courses (courses numbered 101–200) without the written permission of the Instructor and of the Dean*. A student is not permitted to postpone a required first-group course in order to take a second-group course for elective credit. The principle that first-group courses must be taken in the freshman and sophomore years, and advanced courses in the junior and senior years in Columbian College and the professional schools, is rigidly adhered to in approving student programs. No freshman or sophomore on probation may take second-group courses without the written permission of the Committee on Scholarship.

THE DEGREES

REQUIREMENTS FOR THE DEGREES

Residence

The residence requirement for an Associate's degree is 15 hours.

Scholarship

A quality-point index of 2.00 is required.

Curriculum

The satisfactory completion of 64 semester hours is required, as outlined in one of the curricula described below.

Except for students intending to apply for the combined degrees of Bachelor of Arts and Doctor of Medicine or the degree of Bachelor of Science in Medical Technology, not more than 12 hours of professional courses may be included in the 124 hours required for the Bachelor's degrees in Columbian College. Lower division students electing professional courses under this rule must obtain the approval of the Dean before registration.

* Students enrolled in the two-year terminal curriculum in Accounting, the Medical Technology curriculum, and the pre-Pharmacy curriculum may take those second group courses which are specified as part of their freshman-sophomore curricula without first obtaining the written permission of the instructor or the Dean.

Physical Education.—Physical Education or Air Force ROTC Leadership Laboratory is required of all students in the freshman and sophomore years except students enrolled in the Physical Education for Men curriculum. (See "Physical Education Requirements", pages 41 and 42.)

Foreign Language.—In curricula requiring foreign languages a student must complete satisfactorily the equivalent of two years of college work in a single foreign language.

A student offering for admission four acceptable high school units of a single foreign language, or the equivalent, is not required to take any foreign language.

A student who offers less than four units and wishes to meet the requirement by continuing in the same language must take the language placement test (see page 51).

In general, one year of high school language is considered equivalent to one semester of college language.

In some instances foreign languages are required or recommended as preparation for advanced work in Columbian College and the professional schools. The student should consult his adviser as to these requirements, so that appropriate foreign languages may be included, when necessary, in his lower division program.

English.—Entering students registered in the liberal arts and sciences curricula must follow the sequence of English 1 or 1X, both halves of one of the introductory literature courses, and English 4. This does not apply to students transferring to these curricula or students registering in the professional or vocational curricula.

Examinations for Waiving Curriculum Requirements*

A required course may be waived and admission to an advanced course granted by the satisfactory passing of a waiver examination prescribed by the department concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Written request to take the examination should be made to the Dean and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

I. CURRICULA IN PREPARATION FOR THE UPPER DIVISION OF COLUMBIAN COLLEGE AND THE PROFESSIONAL SCHOOLS

Each of the following curricula comprises the first two years of a standard four-year college course and prepares the student for upper division work.

All curricula in this group lead to the degree of Associate in Arts.

A. UPPER DIVISION OF COLUMBIAN COLLEGE

1. ARTS AND LETTERS

The following curriculum constitutes the first two years of the Bachelor of Arts curriculum:

		Semester Hours
English Composition and Literature	English 1 or 1X, 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52; English 4	12
Foreign Language	See foreign language requirement above	12
Physical Education	See pages 41–42 for statement of requirement	4
Science	Biology 1–2†; Chemistry 3–4, 11–12; Geology 1–2; or Physics 11–12	6–8

* This provision does not apply to the premedical student, all of whose required premedical work must be taken in a recognized college of arts and sciences.

† An interdepartmental course offered by the departments of Botany and Zoology.

Social Studies	Economics 1–2; Geography 51, 52; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10; or Sociology and Anthropology 1–2	6
Elective†		22–24
	Total	64

2. SCIENCE

The following curriculum constitutes the first two years of the Bachelor of Science and the Bachelor of Science in Medical Technology curricula. Medical Technology students must include Biology 1–2*, Chemistry 11–12, and Microbiology 112:

English Composition and Literature	English 1 or 1X, 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52; English 4	12
Foreign Language	French, German, Russian, or nonscience elective. NOTE.—A reading knowledge of French, German, or Russian is required. This may be satisfied by French 4, German 4, or Russian 4 or by special examination.	12
Mathematics	Mathematics 3, 6, or electives. NOTE.—The Mathematics 3 requirement may be satisfied by offering two years of high school algebra, acceptable for admission; the Mathematics 6 requirement may be satisfied by offering one-half year of high school trigonometry acceptable for admission.	6
Physical Education	See pages 41–42 for statement of requirement.	4
Science	Biology 1–2*	8
	Chemistry 11–12, Geology 1–2, Physics 11 and 12 or 11 and 14	12–14
Social Studies	Economics 1–2; Geography 51, 52; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10; or Sociology and Anthropology 1–2	6
Elective†		2–4
	Total	64

3. PREMEDICAL

Premedical students may follow either the Arts and Letters or the Science curriculum above in fulfilling the first 60 semester hours of the premedical requirement. Each premedical program must be approved by the premedical adviser.

Well-qualified candidates are eligible for admission to the School of Medicine after completing 90 semester hours, or the equivalent, applicable toward a degree in an approved college. However, they are better prepared for the study of medicine after four years of college work. The Medical College Admission Test, sponsored by the Association of American Medical Colleges, must be taken in advance of the year for which application is made. Specific required courses are:

* An interdepartmental course offered by the departments of Botany and Zoology.

† It is suggested that electives include one of the following courses: Art 31–32, 71–72; Philosophy 51–52; Religion 9–10, 59–60.

Students enrolled in the Medical Technology program should elect Microbiology 112.

The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.

Credit is not given for courses elected in Secretarial Studies; credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

Chemistry:	
Inorganic (including 4 hours of laboratory)	8
Qualitative analysis may be counted as part of this requirement.	
Organic (including laboratory)	6–8
The equivalent of a one-year college course	
Biology (including 4 hours of laboratory)	8
A course in either general biology or zoology	
Physics (including at least 2 hours of laboratory)	8
English Composition and Literature	6

Except for these requirements applicants are urged to follow personal interest in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

4. MEDICAL TECHNOLOGY

The degree of Bachelor of Science in Medical Technology is offered by Columbian College in collaboration with the Department of Pathology and the University Hospital. Candidates should follow the Science curriculum in the lower division, including specifically Biology 1–2*, Chemistry 11–12, and Microbiology 112. See pages 62 and 63 for a description of the course and a statement of further requirements. Specific degree requirements are stated under the Department of Pathology following the listing of the Staff of Instruction.

B. SCHOOL OF PHARMACY:

The following curriculum constitutes the first two years of the five-year Bachelor of Science in Pharmacy curriculum of the School of Pharmacy:

		Semester Hours
English Composition and Literature	English 1 or 1X, 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52; English 4	12
Physical Education	See pages 41–42 for statement of requirement	4
Science	Chemistry 11–12, 151–52; Physics 11, 12; Biology 1–2*	30
Social Studies	Economics 1	3
Mathematics	Mathematics 3 or elective	3
Elective†		12
	Total	64

C. SCHOOL OF EDUCATION:

1. EDUCATION

The following curriculum constitutes the first two years of the Bachelor of Arts in Education curriculum of the School of Education:

English	English 1 or 1X, 2	6
	English 51–52, 71–72, or 91–92	6
Foreign Language	(French, German, Latin, Russian, or Spanish.) See page 52 for foreign language requirement	12
Physical Education	See pages 41–42 for statement of requirement	4
Science	Three semesters (two in biological science and one in physical science or vice versa) to supplement senior high school courses in those fields and chosen from Biology 1–2*; Chemistry 3–4, 11–12; Geology 1–2;	

* An interdepartmental course offered by the departments of Botany and Zoology.
† Credit is not given for courses elected in Physical Education or Secretarial Studies.

	Physics 11, 12. (A student offering for admission two or more acceptable senior high school units in the above areas of science may be exempted from one semester of this requirement.)	10–12
Mathematics	One semester to supplement senior high school courses, chosen from Mathematics 3, 6, 9, 21	3
Social Studies	History 71–72; Political Science 1 and 9, 1 and 10, or 9–10	6
	Economics 1–2; Geography 51–52; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, 9–10; Religion 59–60; Sociology and Anthropology 1–2. (A student offering for admission two or more acceptable senior high school units in social studies may be exempted from this requirement.)	6
Speech	Speech 1 (or 11, if the Department so advises)	3
Psychology	Psychology 1, 22	6
Elective		0–2
	Total	64

2. HOME ECONOMICS†

The following curriculum constitutes the first two years of the Bachelor of Science in Home Economics curriculum of the School of Education:

English	English 1 or 1X, 2	6
	English 51–52, 71–72; Speech 1–2, or 1 and 11	6
Physical Education	See pages 41–42 for statement of requirement	4
Psychology	Psychology 1, 29	6
Science	Biology 1–2*, Chemistry 11–12, Physics 11, 12	6–8
Social Studies‡	Economics, History, Political Science, or Sociology and Anthropology	12
Major Prerequisites	Home Economics 1, 22 (Freshman year)	6
	Home Economics 51, 62 (Sophomore year)	6
Academic Electives	(Freshman year)	9
	(Sophomore year)	3
	Total	64

3. PHYSICAL EDUCATION FOR MEN

The following curriculum constitutes the first two years of the Bachelor of Science in Physical Education curriculum of the School of Education:

English	English 1 or 1X, 2	6
Science	Biology 1–2* (Freshman year)	8
	Chemistry 3–4 (Sophomore year)	8
Social Studies	History 71–72; Political Science 1 and 9, 1 and 10, or 9–10	6
	Sociology and Anthropology 1–2	6
Major Prerequisites	Physical Education 41, 43–44, 47, Speech 1 or 11 (Freshman year)	10
	Physical Education 45–46, 49, 50, 58; Psychology 1, 22 (Sophomore year)	18
Elective		2–4
	Total	64

4. PHYSICAL EDUCATION FOR WOMEN

The following curriculum constitutes the first two years of the Bachelor of Science in Physical Education curriculum of the School of Education:

* An interdepartmental course offered by the departments of Botany and Zoology.
† Open only to students enrolled in this curriculum as of September 1961 or earlier.
‡ Courses are to be selected with the approval of the adviser in the Department of Home Economics.

English	English 1 or 1X, 2	6
	English 51–52, 71–72, or 91–92	6
Physical Education	1–2, 11–12	4
Science	Biology 1–2* (Freshman year)	8
	Chemistry 3–4 (Sophomore year)	8
Social Studies	History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10; or Sociology and Anthropology 1–2	6
Major Prerequisites	Physical Education 43–44 (Freshman year)	4
	Physical Education 49, 50, 51–52; Psychology 1, 22 (Sophomore year)	16
Academic Electives		6
	Total	64

D. SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS:

1. ACCOUNTING AND BUSINESS ADMINISTRATION

The following curriculum constitutes the first two years of the Bachelor of Business Administration curricula in Accounting and in Business Administration of the School of Government, Business, and International Affairs:

Accounting	Accounting 1–2	6
English	English 1 or 1X, 2, 11	9
Foreign Language	See page 52 for foreign language requirement	12
Physical Education	See pages 41–42 for statement of requirement	4
Social Studies	Economics 1–2; Political Science 1 and 9, 1 and 10, or 9–10	12
Speech	Speech 1	3
Statistics	Statistics 51, 52	6
Elective†	(Students interested in Foreign Commerce include Geography 51)	12
	Total	64

2. INTERNATIONAL AFFAIRS AND PUBLIC AFFAIRS

The following curriculum constitutes the first two years of the Bachelor of Arts in Government curricula in International Affairs and Public Affairs of the School of Government, Business, and International Affairs:

English	English 1 or 1X, 2	6
Foreign Language	See page 52 for foreign language requirement	12
Mathematics, Science	Biology 1–2*, Chemistry, Geology, Mathematics, Physics, or Statistics	6 to 8
Physical Education	See pages 41–42 for statement of requirement	4
Social Studies	Economics 1–2; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10	24
Elective†	(To satisfy minimum required credits. Students interested in Foreign Service include Geography 51)	10 to 12
	Total	64

3. BUSINESS AND ECONOMIC STATISTICS

The following curriculum constitutes the first two years of the Bachelor of Business Administration curriculum in the field of Business and Economic Statistics of the School of Government, Business, and International Affairs:

Accounting	Accounting 1–2	6
Economics	Economics 1–2	6

* An interdepartmental course offered by the departments of Botany and Zoology.
† Credit is not given for courses elected in Physical Education or Secretarial Studies.

English	English 1 or 1X, 2	6
Foreign Language	See page 52 for foreign language requirement	12
Mathematics	Mathematics 21, 22, 23	9
Physical Education	See pages 41–42 for statement of requirement	4
Political Science or Philosophy	Political Science 9–10 Philosophy 51–52	6
Statistics	Statistics 51 or 91, 52	6
Elective*		9
	Total	64

II. VOCATIONAL CURRICULA

In addition to the above curricula, the lower division offers the following two-year terminal courses.

The curricula in Accounting and Secretarial Studies lead to the degree of Associate in Arts. The curricula in Home Economics and Physical Sciences lead to the degree of Associate in Science.

1. ACCOUNTING

The required work may be completed in two calendar years on a full-time basis or in three calendar years on a part-time basis, with the approval of the adviser.

Accounting	Accounting 1–2, 101, 111, 121–22, 161, 171, 181, 191, 193	33
Business Administration	Business Administration 131, 161, 162	9
Economics	Economics 1–2	6
English	English 1 or 1X, 2	6
Physical Education	See pages 41–42 for statement of requirement	4
Elective	To be selected with the approval of the adviser	6
	Total	64

2. HOME ECONOMICS†

English	English 1 or 1X, 2	6
	English 51–52, 71–72, 91–92, Russian 91–92; Speech 2 (1, 11)	6
	English 11 or Secretarial Studies 51	3
Home Economics	Home Economics 1, 22, 51, 62	12
Physical Education	See pages 41–42 for statement of requirement	4
Psychology	Psychology 1	3
Secretarial Studies	Secretarial Studies 1, 2	6
Home Economics Elective‡		6–12
Elective*		6–12
	Total	64

3. PHYSICAL SCIENCES

This curriculum is designed for part-time students who do not wish to extend their collegiate education beyond 64 semester hours of work. All other students interested in the study of physical science should follow the Columbian College Science curriculum.

Chemistry	Chemistry 11, 12, 21	12
English	English 1 or 1X, 2, 11	9

* Credit is not given for courses elected in Physical Education or Secretarial Studies.
† Open only to students enrolled in this curriculum as of September 1961 or earlier.
‡ Courses are to be selected with the approval of the adviser in the Department of Home Economics.

Mathematics	Mathematics 3, 6, 21, 22, 23, 24	12–18
Mechanical Engineering	Mechanical Engineering 10	2
Physical Education	See pages 41–42 for statement of requirement	4
Physics	Physics 11, 12, 13, 16, 55	15
Elective	(Speech 1, Economics 1–2 suggested)	4–10
	Total	64

4. SECRETARIAL STUDIES

English	English 1 or 1X, 2	6
	English 51–52, 71–72, 91–92, Russian 91–92	6
Physical Education	See pages 41–42 for statement of requirement	4
Secretarial Studies*	Secretarial Studies 1, 2, 11, 12, 15, 16, 51, 54	24
Social Studies	Economics 1–2, Geography 51, 52, History 39–40, 71–72, Political Science 1 and 9, 1 and 10, or 9–10, or Sociology and Anthropology 1–2	6
Accounting	Accounting 1	3
Speech	Speech 11	3
Elective	To be selected with the approval of the adviser	12
	Total	64

UPPER DIVISION

A student with 64 or more acceptable semester hours, whether earned in this University or transferred from another institution, is registered in the upper division of Columbian College. It is assumed that he has met the requirements of the lower division *Arts and Letters* or *Science* curriculum. If he has not, he must begin to make up his deficiencies immediately upon admission and continue to carry courses to this end until all requirements are met.

THE BACHELOR'S DEGREES

Columbian College through its upper division offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Science in Medical Technology.

In cooperation with the School of Medicine a seven-year curriculum leading to the combined degrees of Bachelor of Arts and Doctor of Medicine is offered.

REQUIREMENTS FOR THE DEGREES

A minimum of 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the upper division of Columbian College. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

For the regulation governing students who are absent from the University for one semester or more, see page 42.

* Qualified students, upon the approval of the adviser or the satisfactory completion of a placement test, may waive Secretarial Studies 1, 11, and 12. Other courses, approved by the adviser, will be substituted.

Curriculum Requirements

The curriculum requirements for the Bachelor's degrees include at least 60 semester hours beyond those of the appropriate lower division curriculum and the satisfactory completion of the major. Each program must be approved by the major adviser and by the Dean.

At least 24 of the last 60 hours counted toward the Bachelor's degree must be taken in subjects* not included in the major field or department. The student should consult his major adviser at each registration concerning his choice of electives.

Except for premedical and medical technology students, not more than 12 hours of professional courses may be included in the undergraduate program. The election of professional courses must be approved by the Dean's Council prior to registration. Ordinarily courses in Physical Education, Secretarial Studies, and technical courses in Education will not be approved toward a degree.

A change in degree candidacy (e.g., from Bachelor of Arts to Bachelor of Science) requires the permission of the Dean. The degree requirements effective at the time the change is approved must be met.

Each student must select and file with the Dean a choice of major upon entering the upper division. He may change the major only with the consent of the Dean and of the department or committee concerned, and must meet the requirements for the new major which are in effect at the time the change is approved.

First-group courses may be required as prerequisites to the major, but because of their introductory character they may not be counted as part of such programs. (See "Explanation of Course Numbers.")

Students transferring from other institutions or from other schools, colleges, or divisions in this University with major requirements wholly or substantially met must complete satisfactorily at least 12 semester hours of approved work in the major field in the upper division of Columbian College. This work will count as part of the minimum residence requirement.

Examination for Waiving Curriculum Requirements.—A required course may be waived and admission to an advanced course granted by the satisfactory passing of a waiver examination prescribed by the department concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Written request to take the examinaion should be made to the Dean and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

Independent Study Plan

A junior or senior of demonstrated capacity, with special interest in the subject matter of a course, may be permitted to undertake independent study under the personal direction of an instructor, in accordance with the rules of the department or departments concerned. Credit under this plan is limited to the specific course-credits as designated in the list of courses of instruction.

Graduate Record Examinations

During the final semester of the senior year students in Columbian College are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and

* Art, Biology, Botany, Chemistry, Classical Languages and Literatures, Economics, English, Geography, Geology, Germanic Languages and Literatures, History, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Religion, Romance Languages and Literatures, Slavic Languages and Literatures, Sociology and Anthropology, Speech, Statistics, Zoology.

Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities.

The examinations are conducted by the University twice a year: the Fall Testing Session for seniors graduating in February, and the Spring Session for those graduating in June. Dates of the examinations are announced in the *Schedule of Classes*.

Each senior must register for the Graduate Record Examination when he registers for his final regular semester of study (excluding summer sessions). A $10 examination fee is payable at the time of registration.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

BACHELOR OF ARTS

The work of the junior and senior years, including a major in one of the following fields must be approved by the major adviser and by the Dean.

Major Fields.—American Thought and Civilization: Art (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, and (4) Commercial Art; Biology: Botany; Chemistry; Economics; English Literature; French Language and Literature; Geography; Geology; Germanic Languages and Literatures; History; Journalism; Latin; Latin American Civilization; Mathematical Statistics; Mathematics; Philosophy; Physics; Political Science; Psychology; Religion; Russian; Sociology and Anthropology; Spanish American Literature; Spanish Language and Literature; Speech (Speech or Dramatic Art); Zoology.

Combined Degrees of Bachelor of Arts and Doctor of Medicine.—A candidate for the combined degrees of Bachelor of Arts and Doctor of Medicine must: (1) complete the Medical School entrance requirements; (2) fulfill the Arts and Letters curriculum of the lower division requirements (see pages 52-53); (3) accumulate 94 semester hours in the liberal arts, including a minimum of 30 in the upper division of Columbian College; (4) obtain the approval of the Dean of Columbian College at the time of entering the School of Medicine; (5) obtain the recommendation of the Dean of the School of Medicine at the completion of all prescribed courses in the first year of the School of Medicine, at which time the degree of Bachelor of Arts will be conferred (professional work taken at another institution will not satisfy the major requirement for the combined degrees); (6) maintain throughout the entire course the scholarship level required for graduation.

BACHELOR OF SCIENCE

The work of the junior and senior years, including a major in one of the following sciences, must be approved by the major department or division and by the Dean.

Biological Sciences: Biology, Botany, Zoology. *Physical Sciences:* Chemistry, Geology, Mathematical Statistics, Mathematics, Physics.

THE UNDERGRADUATE MAJOR

There are two types of undergraduate majors: the field-of-study major and the departmental major.

The Field-of-Study Major

Each Field-of-Study Major covers a carefully worked out field of coordinated study and is under the supervision of the appropriate department and the Columbian College Committee on Studies.

The *Field-of-Study Major* requires no specific number of semester hours, no specific program of courses, and no specific quality-point index for the major, although the student is required to meet the over-all general requirements for the degree (at least 124 semester hours with a quality-point index of at least 2.00). Ability to pass the Major Examination is assumed to be a convincing demonstration that the student possesses the breadth, depth, and quality of knowledge of his major usually defined in terms of semester hours, courses, grades, and a better-than-average quality-point index. A pamphlet on each field is obtainable either from the appropriate adviser or from the Office of the Dean. The prospective student should place himself under the direction of the appropriate adviser immediately upon completing lower division work and beginning his junior year.

The Field-of-Study Major places special emphasis on the intellectual development of the individual student. Programs in the same major may vary, depending upon the individual student's background, previous study, reading habits, and aptitudes. The student is expected to consult his adviser frequently, and the special proseminar offered in the field gives him further opportunity for individual advice and direction in pursuing a program especially adapted to his needs and abilities. A close student-adviser relationship is essential for the student's success under the Field-of-Study Major plan.

The following Field-of-Study Majors are offered: American Thought and Civilization, English Literature, French Language and Literature, History, Latin American Civilization, Mathematical Statistics, Philosophy, Spanish American Literature, Spanish Language and Literature, Zoology.

The major in American Thought and Civilization and in Latin American Civilization involve studies in two areas, those of Languages and Literatures and of Social Sciences. The other Field-of-Study Majors, with the exception of the major in Spanish American Literature, replace departmental majors in their respective fields. A candidate for a Bachelor's degree with a major in English Literature, French Language and Literature, History, Mathematical Statistics, Philosophy, Spanish American Literature, Spanish Language and Literature, or Zoology must elect a Field-of-Study Major.

Proseminar in the Major

A proseminar is offered in each field to help the student in his reading, study, and laboratory exercises acquire a coordinated knowledge of his field. It is a presentation of the content and methods of the major field as a whole through the organization and coordination of the knowledge obtained in the various formal courses in the major subject and of material not usually included in such courses. This course is not required. Six semester hours, but no qualitative grade, may be assigned. When registered in this course, the student has the privilege of visiting, subject to the approval of the instructor, any other appropriate course offered in the College. (Regular attendance in a course, either for credit or as an auditor, requires registration and payment of tuition.) Proseminars are open only to the student who has been accepted as a candidate under that specific major.

The Major Examination

The Major Examination will normally be taken at the close of the senior year; a student on a limited schedule may take it no earlier than one calendar year before graduation. A student who fails to pass a Major Examination may, at the discretion of the Committee on Studies, be reexamined at a later regular major-examination period. The Committee on Studies has general supervision of the preparation, reading, and grading of Major Examinations. Major Examinations are held each semester on dates fixed by the department or departments concerned, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session.

Departmental Majors

Departmental Majors, unlike Field-of-Study Majors, are defined in terms of credit hours, required courses, and the attainment of a quality-point index of at least 2.50 in all second-group courses taken in the major field. The minimum specific requirements for Departmental Majors are listed below the staff of instruction of the department concerned. The Chairman of the Department, or designated departmental adviser, should be consulted at registration concerning the student's program of courses; and the entire program, including electives, must be approved by the Department. The student is also expected to consult the Chairman or adviser in all matters affecting his program of studies, such as changes, substitutions, or withdrawals, and especially concerning his progress in his courses. As far as possible the close student-adviser relationship developed in the Field-of-Study Major will be cultivated also in Departmental Majors.

Departmental Majors are offered in the following: Art (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, and (4) Commercial Art; Biology; Botany; Chemistry; Economics; Geography; Geology; Germanic Languages and Literatures; Journalism; Latin; Mathematics; Physics; Political Science; Psychology; Religion; Russian; Sociology and Anthropology; Speech (Speech or Dramatic Art).

BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

In cooperation with the University Hospital and the Department of Pathology of the School of Medicine, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

A candidate for this degree must complete the Science curriculum in the lower division, including Biology 1–2*, Chemistry 11–12, 21, and 22; and Microbiology 112; fulfill the Columbian College requirements for degrees, including the residence requirement of at least 30 semester hours; complete the 12-month Medical Technology Course in the University Hospital (see the Department of Pathology), which constitutes the major and prepares students for the national certifying examination given by the Registry of Medical Technologists; and maintains throughout the entire course the scholarship level required for graduation.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. (See page 31.) All students in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital. A cash allowance of $65 a month is granted during the last 6 months of the fourth year in training.

* An interdepartmental course offered by the departments of Botany and Zoology.

Admission to the Columbian College degree program does not assure acceptance in the Hospital program.

For information concerning the Medical Technology Course for students not interested in degree candidacy, see the special bulletin.

THE GRADUATE DIVISION

The graduate division offers programs leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

Definition of the Master's Work

The study leading to a Master's degree is a comprehensive survey of an area of knowledge, usually in the student's undergraduate field, with emphasis on scholarly method.

The student must satisfy certain minimum requirements as to preparation, residence, ability to read an approved modern foreign (European) language, and courses taken; but these requirements, while essential, are regarded primarily as qualifying measures. The student's knowledge of his field, as demonstrated by his thesis and by the results of his Master's Examination (together with such other examination involving special skills or techniques as the department or the Committee on Studies may require), is the basis upon which the Master's degree is conferred.

Master of Arts

Graduate work leading to the degree of Master of Arts is offered in the following fields:

American Literary and Cultural History, Art History and Criticism, Biochemistry, Biology, Botany, Chemistry, Economics, English and American Literature, English Literature, French Language and Literature, Geography, Geology, Germanic Languages and Literatures, History, Latin American Civilization, Mathematical Statistics, Mathematics, Microbiology, Pharmacology, Philosophy, Physics, Physiology, Political Science, Psychology, Religion, Religious Education, Sociology and Anthropology, Spanish American Literature, Spanish Language and Literature, Speech Correction, Zoology.

Special programs involving coordinated work in two or more departments may be arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

Master of Science

Graduate work leading to the degree of Master of Science is offered in the following fields:

Anatomy, Biochemistry, Biology, Botany, Chemistry, Geology, Mathematical Statistics, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology, Zoology.

Special programs involving coordinated work in two or more departments may be arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

Master of Fine Arts

Graduate work is offered leading to the degree of Master of Fine Arts in the fields of Painting and of Sculpture (see the Department of Art) and in the field of Dramatic Art (see the Department of Speech).

REQUIREMENTS FOR THE DEGREES

Residence

Normally, an academic year of residence in the graduate division of Columbian College is required, i.e., completion of a minimum of 30 semester hours of work including the thesis, which is counted as the equivalent of 6 semester hours of course work. Summer work may be counted in residence, but in no case may the period of residence aggregate less than twenty-seven weeks. Not more than 12 semester hours (which must be approved in advance by the Dean) may be taken in another school or division of this University, and such work may not be counted toward both a degree in that school or division and the Master's degree in Columbian College. ***No part of the minimum requirement may be taken elsewhere.*** All work for the degree of Master of Arts, Master of Science, or Master of Fine Arts must be completed within a maximum of three years, unless the Dean's Council considers the circumstances so unusual as to justify an extension of time.

Scholarship

Grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete).

The grade of *E* must be attained in at least 6 semester hours of the course requirements for the degree.

A student whose scholarship is unsatisfactory may be suspended by the Dean upon recommendation of the department under which the student is working. A Master's candidate who accumulates 9 hours or more of *U* (including grades of *C* or lower in prerequisite courses) will be automatically suspended.

Program of Studies

The student's program of studies must be outlined in detail at the beginning of his work, in triplicate, on forms available at the Office of the Dean. Each program is subject to the approval of the department and the appropriate member of the Committee on Studies. The program may be revised, but any change necessitates a repetition of the procedures just described.

The candidate for the Master's degree ordinarily may specialize exclusively in the field of his choice. Any student, however, whose undergraduate training does not include at least one full year of work in each of the following areas of study: (1) mathematics or science (with or without laboratory), (2) social science, and (3) the humanities (literature, philosophy, art, music, or religion), must make up this deficiency in his general education before being admitted to candidacy for the Master of Arts degree. This last provision does not apply to candidates for the Master of Science degree.

Courses numbered from 1 to 100 may not be credited toward the Master's degrees, but may in certain instances be required as a basis for advanced work. At least 6 semester hours of the course work required for the degree must be taken in courses numbered over 200. Courses numbered between 100 and 200 may be credited toward

the degree, if completion of additional work has been certified by the appropriate officer of instruction. (See "Explanation of Course Numbers".)

A student who expects to continue his studies for the degree of Doctor of Philosophy after receiving the Master's degree is strongly advised to plan his program from the beginning so that work for the lower degree will constitute the initial stage of the doctoral discipline and, upon completion, will admit him to full status in the Graduate Council.

Foreign Language Requirement

Before being admitted to candidacy the student must show that he has a reading knowledge (certified by the appropriate foreign-language department) of at least one foreign language, selected by the department or committee under which he is studying. A student whose field is a modern foreign language or literature may not offer that language in satisfaction of the reading-knowledge requirement. Any candidate who chooses to meet the language requirement in French, German, or Spanish and has not passed the language examination by the end of 15 attempted semester hours must register for French 49, German 49, or Spanish 49 as part of his next registration. The Master's reading examination is given at the first and last class meeting of each of these courses and on the last Saturday of the summer term. No student will be permitted to take the examination after three unsuccessful attempts. Those enrolled in French 49, German 49, or Spanish 49 who pass the first examination are excused from the course and will receive a refund of tuition. Students who expect to take a reading examination in any approved language other than French, Spanish, or German should notify the Dean at the time of registration.

Students are reminded of the necessity for early satisfaction of this requirement, normally not later than the end of the first semester of registration for the degree.

Admission to Candidacy

A student must be admitted to candidacy before he begins the last half of his work for the Master's degree, i.e., not later than the completion of 15 semester hours of degree courses. Application for admission to candidacy is made on a form obtained at the Office of the Dean, and must be approved by the appropriate representative of the department or committee and by the Dean. If a prospective candidate, in his previous academic work, has not substantially satisfied the prerequisites for the Master's degree, including the undergraduate major as defined by the appropriate department or committee, he will not be admitted to candidacy until such deficiency has been made up. He may make up his deficiencies by electing appropriate courses in addition to those counted toward his degree.

The Thesis

The thesis may be of a research, expository, critical, or creative type. The main purpose of a Master's thesis is to demonstrate the student's ability to make independent use of the information and training acquired through his other disciplines, and to furnish objective evidence of his constructive powers in his chosen field. Registration for the thesis must be no later than the beginning of the final year of preparation, unless the professor in charge of the thesis permits registration at the beginning of the final semester. The choice of the thesis subject must be approved by the professor in charge of the student's field and filed in the Office of the Dean by the date announced in the University calendar. Registration for the thesis is

ordinarily made on the basis of 3 hours for each of two successive semesters. In exceptional cases, and with the approval of the professor in charge of the thesis, the student may register for the entire 6 hours during a single semester. The thesis in its final form must be presented to the Dean, no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period the student must register for it again, and pay tuition on the same basis as for a repeated course.

The Master's Examination

In addition to such other examinations as may be required, the candidate must pass a general written examination on the major subject. Examinations are held on dates fixed by the department or committee, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session. A candidate who fails to pass the Master's Examination may, in exceptional circumstances and with the specific approval of the Committee on Studies, repeat the examination, but only after the lapse of one semester. If he fails a second time, no further opportunity to take the examination will be permitted.

THE GRADUATE COUNCIL

A. E. Burns†, *Dean*

MEMBERS OF THE COUNCIL*

Professors P. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns†, R. D. Campbell, J. H. Coberly, R. H. Davison, Mitchell Dreese‡, D. C. Faith, Wood Gray, A. M. Griffin, I. B. Hansen, P. H. Highfill, Jr., Thelma Hunt, Herbert Jehle, F. E. Johnston, E. L. Kayser, J. W. Kendrick, R. D. Kennedy, W. H. Kraus, C. E. Leese, W. K. Legner, C. D. Linton, T. P. G. Liverman, H. G. Mandel, G. E. McSpadden, Florence Mears, H. M. Merriman, S. C. Munson, C. R. Naeser, N. D. Nelson, C. E. Olmstead, T. M. Peery, T. P. Perros, E. M. Renkin, Mary Robbins, W. F. Sager, Wilson Schmidt, Lewis Slack§, R. B. Stevens, I. R. Telford, C. R. Treadwell, F. S. Tupper, B. D. Van Evera, D. S. Watson, W. R. West, N. A. Wiegmann, R. E. Wood, A. M. Woodruff, S. N. Wrenn

Associate Professors F. D. Allan, J. G. Allee, Jr., W. E. Caldwell, W. G. Clubb, W. C. Davis, Clarke Davison, A. H. Desmond, F. P. J. Diecke, R. C. Haskett, C. W. Hill, H. H. Hobbs, Rudolph Hugh, J. C. King, H. L. LeBlanc, C. Y. Meade, J. N. Mosél, J. P. Reesing, Jr., J. W. Robb, L. E. Schlesinger *(Research)*, William Schmidt,

* The President of the University, the Dean of Faculties, and the Registrar of the University are members of the Council.
This listing of Members of the Council and Consultants in Research is for the academic year 1961–62.
† On sabbatical leave spring semester 1961–62.
‡ On leave of absence 1961–62.
§ On leave of absence spring semester 1961–62.

J. W. Skinner, Rafael Supervia, R. B. Thompson, C. E. Tuthill, R. D. Walk, R. H. Walker, Jr.

Assistant Professor V. H. Cohn, Jr., J. F. Henderson *(Research)*, Ruth Henderson, Paul Mazel, C. S. Tidball *(Research)*, R. C. Wood, S. S. Yeandle, Jr.

Consultants in Research Antonio Alonso, R. A. Altenbern, Julius Axelrod, Roscoe Brady, Jr., G. M. Briggs, B. B. Brodie, Arthur Brown, Dean Burk, J. J. Burns, W. R. Carroll, H. M. Cathey, C. L. Christ, J. F. Clark, Gerhard Colm, Loran Danielson, Margaret deVries, W. R. Duryee, F. N. Frenkiel, James Gillette, Abraham Goldin, N. B. Gove, R. L. Grant, Edward Haeskaylo, H. F. Haviland, Jr., Roy Hertz, Roger Hilsman, Leon Jacobs, L. C. Johnson, Solomon Kullback, B. N. La Due, Jr., H. M. Lenhoff, L. L. Marton, Margaret Mercer, Winfred Overholser, J. J. Polak, M. I. Protzman, J. H. Roe, L. P. Schultz, W. A. Shropshire, Jr., R. S. Sigafoos, L. B. Smith, DeWitt Stetten, Jr., T. D. Stewart, M. J. Surgalla, Sidney Udenfriend, Ludwig von Sallmann, F. W. Weida, G. G. Wright, R. A. Young

GENERAL INFORMATION

INTRODUCTORY

The Graduate Council offers a program of advanced study and research leading only to the degree of Doctor of Philosophy. It was established in 1930 to replace the Graduate School which had formerly administered work for the Master's as well as the Doctor's degrees. The Graduate Council provides a doctoral discipline which moves freely across administrative lines dividing departments of instruction or fields of study. It gives personal supervision to a limited number of students, each of whom has his own consultative committee, examinations, and research direction.

ADMISSION PROCEDURE

For admission to doctoral work the student must possess adequate preparation for advanced study, together with acceptable personal qualities and a capacity for creative scholarship. Adequate preparation presupposes a satisfactory Bachelor's degree in the same general field as that proposed for doctoral study. Students beginning the first year of graduate study who plan to work towards the degree of Doctor of Philosophy are given provisional status in the Graduate Council. However, if these students wish, and if the Dean of the Graduate Council so advises, they may register for the Master's degree in the liberal arts college (Columbian College of Arts and Sciences) or in the School of Government, Business, and International Affairs during the first year and apply for transfer to full status in the Council upon completion of the Master's degree work.

Application forms may be obtained from the Office of the Dean of the Graduate Council. The form must be filled out completely and returned with the application fee of $10, together with a recent photograph, signed by the applicant. At the time of filing the application, the student should request that transcripts of all previous academic training be sent to the Office of the Dean, together with letters of recommendation. Each application, with transcripts and letters, is examined by a committee which, if the applicant is accepted, constitutes his Consultative Committee. This Committee supervises all aspects of the student's program and work leading to the General Examination.

THE PLAN OF WORK

The discipline for the degree is divided into three stages. (1) The first year of graduate study constitutes the initial stage, either in the Graduate Council on provi-

sional status, or in Columbian College of Arts and Sciences or the School of Government, Business, and International Affairs enrolled as a Master's candidate intending to gain full status in the Council.* (2) Full status in the Council follows completion of the first year of graduate study and culminates in the General Examination. (3) The final stage is given to research and investigation of a particular project in a special field, the presentation of the findings in a written dissertation, and the Final Examination.

LANGUAGE EXAMINATIONS

French and German are the normally required languages; reading proficiency must be demonstrated by examination. The examinations are arranged through the Office of the Dean. The satisfactory completion of French 49 and/or German 49 meets the language requirement. The Consultative Committee may allow either French or German to be replaced by another language important to the student's research interest. Language examinations may be taken soon after entrance, but the first one must be passed no later than the beginning of the second semester following admission. The second examination must be passed well before completion of work for the General Examination.

THE FIRST YEAR OF STUDY

A student who enters the Graduate Council on provisional status to undertake the first year of graduate study has his program planned by a Consultative Committee. If the first year of work is taken in Columbian College of Arts and Sciences or the School of Government, Business, and International Affairs preparatory to gaining full status, Graduate Council advisers aid in planning the Master's program to fit the work into the doctoral program of the student. Upon satisfactory completion of the first year, the student is eligible to apply for full status. Students who have completed a year of satisfactory graduate work at other universities are also eligible to apply directly for full status in the Graduate Council.

STUDY FOR THE GENERAL EXAMINATION

At the beginning of the student's full status, the Consultative Committee is assigned to direct his work in an integrated group of fields of learning, usually five or six in number, deemed necessary to insure his breadth of knowledge, as well as to support the dissertation project in his central field. Members of the Consultative Committee advise the student concerning the scope and content of these supporting fields, and assist him in preparation for his examination in them.

This advanced study in full status does not entail the taking of a second full year of graduate courses and seminars. Additional course work may not be necessary in some cases; in any event, the Consultative Committee determines whether such additional course work is needed, and if so, how much. In this stage of the work the main emphasis in preparation is on conferences with committee members and independent study. Performance in the General Examination is the test of the student's ability to enter upon the final stage of his doctoral discipline.

The examination is a series of written tests usually extending over a period of one week. The major portion of a day is given to each part of the examination covering one of the fields of study on the student's program. If the results of the examination are satisfactory the student is admitted as a doctoral candidate, to pursue his specialized study and research under the supervision of a member of the Council.

* Students on a part-time basis will normally complete a year of graduate study in two years.

RESEARCH, THE DISSERTATION, AND THE FINAL EXAMINATION

After the student has been admitted as a doctoral candidate and his research program has been arranged, he is responsible to the member of the Council who directs his research project. The Director of Research and the Consultative Committee may require further course work, where circumstances warrant such action. The candidate may enjoy unrestricted use of all the academic facilities of the University. When necessary, the Graduate Council makes provision for sending the candidate to some other institution, library, or laboratory for special study in connection with his doctoral investigation.

The doctoral dissertation is required of all candidates as evidence of ability to perform scholarly research and to interpret its results. No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. Printed copies of detailed regulations regarding the form and reproduction of the dissertation and its summary (see page 43) are available in the Office of the Dean. The summaries of accepted dissertations are printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

When the completed dissertation has been approved by the Director of Research and by two other members of the Council, and submitted to the Office of the Dean, the candidate is presented for his final examination. This examination is oral and open to the public. The committee of examiners includes not only members of the Council competent in the research field or in closely related subjects, but also at least two qualified experts from other research institutions brought to the University to participate in the examination. If the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Council recommends him for the degree of Doctor of Philosophy.

FIELDS OF RESEARCH

The following fields of research have been authorized by the Graduate Council as those in which doctoral investigations and dissertations may be undertaken. The supporting fields of study required of all candidates for the degree of Doctor of Philosophy are specified for each individual student by his Consultative Committee before admission to study under the Council.

This list of fields is subject to such changes as the educational resources of the University may direct. The prospective student may address preliminary inquiries concerning his research interests to the member of the Council who is in charge of the field, or to the Dean of the Graduate Council.

LITERATURES AND LANGUAGES

American

(1) Fiction; (2) Literary Nationalism — Coberly
Social Themes in Literature — Walker

English

(1) Sixteenth Century Drama; (2) Seventeenth Century Drama — Tupper
Seventeenth Century Literature — Reesing
(1) Eighteenth Century Literature; (2) History of English Drama — Highfill
Twentieth Century Literature — Linton

Germanic

(1) Middle High German Language and Literature; (2) Early New High German Language and Literature	Legner
(1) Old High German Language and Literature; (2) German Romanticism	King
Old Norse Language and Literature	Allee

Romance

Modern Spanish Literature	Alonso
(1) Linguistics; (2) Spanish American Literature; (3) Spanish Literature	McSpadden
Seventeenth Century French Literature	Protzman
French Literature since 1880	Clubb
(1) Eighteenth Century French Literature; (2) Twentieth Century French Literature	Meade
(1) Nineteenth Century Spanish Literature; (2) Twentieth Century Spanish Literature	Supervía
(1) Spanish American Literature; (2) Modern Spanish Literature	Robb

Social Sciences

Economics

History of Economic Thought	Burns
Economic Policy	Watson
Economic Theory	Watson, Skinner
International Economics	Schmidt
International Finance	Polak, Young, de Vries
Methodology of Economics	Skinner
National Income	Kendrick, Colm
Public Finance	Colm
Soviet Economics	
Transportation	Kennedy

Geography

City Planning	Woodruff
Cultural Geography	Mosél, Campbell
Regional Planning	Woodruff, Campbell
Regional Industrial Development	Woodruff

History

European: Diplomatic since 1815	Davison
European: Nationalism	Kayser
European: Russian and Soviet	Thompson
History of Religion in the United States	Olmstead
The Modern Near East	Davison
Latin American	Davis
United States: Diplomatic	Merriman
United States: (1) Social; (2) Economic	Gray
United States: Political	Haskett

International Relations

Program includes work in Economics, History, and Political Science

Political Science

Comparative Government and Political Theory	Kraus
International Politics and Organization	
International Law: (1) War and Neutrality; (2) Arbitration	Brewer
International Relations	Hilsman
International Relations, especially American Foreign Policy	Haviland
(1) The Political Process; (2) Political Controls Over Administrative Agencies	LeBlanc
United States: (1) The Legislative Process; (2) Governmental Organization and Administration	West

Psychology

Abnormal	Mercer
Comparative	Caldwell
Counseling and Guidance	Dreese
Experimental	Hill, Walk
Military Counseling and Guidance	Faith
Personnel Psychology	Mosél
(1) Psychological Measurements; (2) Abnormal Psychology	Hunt
Social Psychology	Schlesinger, Tuthill

Mathematical and Physical Sciences

Chemistry

Analytical	Schmidt
Geochemistry	Naeser, Christ
Inorganic	Naeser, Perros
Organic	Wrenn
Physical: Kinetics and Electrochemistry	Wood
Physical: Solubilities	Van Evera
Physical-Organic: Reaction Mechanisms	Sager

Mathematics

Algebra: Finite Groups	Johnston
Algebra: Matrix Theory	Wiegmann
Analysis: Functional Analysis	Liverman
Analysis: Infinite Series	Mears
Mathematical Logic	Nelson

Physics

Atmospheric Physics	Clark
Behavior of Electrons in Solids	Hobbs
Biophysics; Theoretical: (1) Quantum Mechanics; (2) Molecular Physics; (3) Relativity	Jehle
Electron Optics	Marton
(1) Experimental Nuclear Physics; (2) Radioactivity	Slack
Experimental Biophysics	Yeandle
Low Energy Nuclear Physics	Gove
Theoretical: Aerodynamics	Frenkiel

Statistics

Multivariate Analysis	Kullback
(1) Applied: Econometrics; (2) Theoretical: Probability and Sampling	Weida
(1) Psychometrics; (2) Managerial Statistics	Bright

Medical Sciences

Anatomy

Embryology	Allan
Gross Anatomy	Telford
Histology	Telford, Johnson
Neuro-ophthalmology	von Sallmann
Physical Anthropology	Stewart

Biochemistry

Amino Acid Metabolism	La Du, Udenfriend
Animal Nutrition	Briggs
Ascorbic Acid Metabolism	Burns
Biochemical Detoxication	Brodie
(1) Carbohydrate Metabolism; (2) Nutrition (emphasis on vitamins); (3) Pathological Chemistry	Roe
Carbohydrate Metabolism	Stetten
Chemistry and Metabolism of Proteins	Carroll

Complex Lipids	Brady
Lipids	Treadwell
Metabolic Relationships of Insulin	Grant
Protein Biosynthesis	Lenhoff
Tissue Respiration	Burk

Microbiology

Bacterial Physiology	Wood
Bacterial Physiology and Nutrition	Altenbern
Determinative Bacteriology	Hugh
Immunology	Surgalla, Wright
(1) Intestinal Microbiology; (2) Immunology: Antigenic Analysis	Griffin
Microbiology	Jacobs
Virology	Robbins, Brown

Pathology

Comparative Pathology	Peery

Pharmacology

Chemotherapy	Goldin, J. Henderson, Mandel
Drug Metabolism	Axelrod, Cohn, Davison, Gillette, Mazel, Mandel
Neurohormones	Udenfriend

Physiology

Cardiovascular Physiology	Renkin, Leese
Cellular Physiology	Duryee, Renkin
Endocrinology	Hertz
Gastrointestinal Physiology	Tidball
Membrane Physiology	Renkin, Diecke
Neurophysiology	Diecke, Leese
Renal Physiology	R. Henderson

Psychiatry

Problems of Treatment (M.D. degree required for admission)	Overholser

BIOLOGICAL SCIENCES

Biology

Cytology	Bowman

Botany

(1) Mycology; (2) Plant Pathology	Stevens
Taxonomy	Smith
Photobiology	Shropshire
Plant Physiology: Vascular Plants	Cathey
(1) Mycology; (2) Plant Physiology; Micro-organisms	Hacskaylo
Plant Ecology	Sigafoos
Plant Physiology	Danielson

Zoology

Entomology: Insect Physiology	Munson
Histophysiology	Desmond
Vertebrate: Embryology and Morphogenesis	Hansen
Vertebrate: Ichthyology	Schultz

POST-DOCTORAL STUDY

The Council expects its graduates to continue their interests in advanced study and research, and to contribute to its program. They may continue any studies in the University without payment of tuition, and enjoy all University library privileges. Such graduates are required to pay only the usual residence fee in order to establish their active membership in the University. The use of laboratory space and equip-

ment is contingent upon availability, and the cost of all laboratory or special library material is paid by the graduate. Special arrangements for such privileges must be made with the Dean of the Council. Post-doctoral work taken under this privilege may not be applied toward any degree offered by the University.

REGULATIONS

Regulations regarding REGISTRATION, FEES AND FINANCES *are stated on pages 19–23; other University regulations, on pages 39–45.*

RESIDENCE AND CONTINUOUS REGISTRATION

The Graduate Council expects all students to work on their doctoral programs in residence, although there is no formal regulation concerning the minimum amount of time of resident study either in preparation for the General Examination or as a doctoral candidate engaged in doctoral research. The student who undertakes either part of the doctoral program on full or limited schedule must, in accordance with University regulations, maintain continuous registration under the Graduate Council even when the Council has granted a leave of absence for study or residence elsewhere. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student (see page 42). In such case, the student must reapply for admission to the Council, under whatever new conditions and regulations are set up by his Consultative Committee or the member of the Council who directs his research.

TEACHING FELLOWSHIPS AND GRADUATE ASSISTANTSHIPS

A limited number of teaching fellowships are assigned annually to certain departments of instruction open to doctoral students registered in the Graduate Council. In many departments of instruction graduate assistants are appointed to assist in the academic program. Applicants for teaching fellowships and graduate assistantships should inquire directly of the chairman of the department concerned regarding vacancies, details of appointment, and the kind of personal data to be supplied for consideration.

UNITED STATES GOVERNMENT FELLOWSHIPS

The University is participating in the following Government Fellowship Programs: National Science Foundation Cooperative Graduate Fellowships and Summer Fellowships for Graduate Teaching Assistants, and the Fellowships created under the National Defense Education Act. Qualified students should write directly to the Dean of the Graduate Council for information and applications for these Fellowships.

THE SCHOOL OF MEDICINE *

THE FACULTY†

John Parks, *Dean;* A. M. Griffin, *Associate Dean;* A. E. Parrish, *Associate Dean;* C. B. Ethridge, *Director of Postgraduate Medical Education*

Professors H. F. Anderson, R. H. Barter, Brian Blades, T. M. Brown, Paul Calabrisi, C. S. Coakley, R. A. Cox, C. B. Ethridge, A. M. Griffin, C. E. Leese, H. G. Mandel,

* Faculty and committee members listed here are for the academic year 1961–62.
† The President of the University, the Dean of Faculties of the University, and the Registrar of the University are members of the Faculty.

John Parks, T. M. Peery, E. M. Renkin, W. W. Stanbro, Harold Stevens, I. R. Telford, C. R. Treadwell, J. W. Watts, C. S. Wise, Leon Yochelson

Clinical Professors W. S. Anderson, L. R. Culbertson, W. A. Howard, W. S. McCune, E. A. W. Sheppard

Associate Professors F. N. Miller, Jr., A. E. Parrish

Associate Clinical Professor J. J. McFarland, Jr.

Assistant Clinical Professor J. L. Levine

Administrator of the University Hospital V. F. Ludewig

COMMITTEES*

The Dean's Council

Brian Blades, T. M. Brown, T. M. Peery, I. R. Telford, J. W. Watts, V. F. Ludewig

Committee on Admissions

Paul Calabrisi, *Chairman*

Ruth Henderson, G. F. Kelser, W. P. McKelway, F. N. Miller, J. E. Rankin

Committee on Curriculum

T. M. Peery, *Chairman*

E. M. Renkin, M. J. Romansky, J. G. Sites, I. R. Telford, J. R. Thistlethwaite, C. R. Treadwell

Committee on Scholarship

I. R. Telford, *Chairman*

Brian Blades, T. M. Brown, H. G. Mandel, F. N. Miller

Committee on Research

C. R. Treadwell, *Chairman*

J. M. Evans, T. N. Johnson, H. G. Mandel, H. C. Pierpont, Harold Stevens

Committee on Library

C. E. Leese, *Chairman*

Mary Robbins, C. S. Wise

Committee on Graduate and Postgraduate Education

C. B. Ethridge, *Chairman*

Seymour Alpert, R. H. Barter, Brian Blades, Leon Yochelson, V. F. Ludewig

Committee on Appointments and Promotions

Brian Blades, *Chairman*

T. M. Peery, C. R. Treadwell

Advisory Committee on Cancer Research

L. K. Alpert, *Chairman*

Frank Allan, J. M. Bailey, C. T. Klopp, W. P. McKelway, William Newman, H. C. Pierpont, Mary Robbins, W. W. Saunders

* The Dean and Associate Deans of the School of Medicine are members ex officio of all committees.

ADVISORY COMMITTEE ON REHABILITATION

C. S. Wise, *Chairman*

J. P. Adams, T. M. Brown, J. M. Evans, Irene Tamagna, J. R. Thistlethwaite

ADVISORY COMMITTEE ON STUDENT AFFAIRS

F. N. Miller, *Chairman*

Seymour Alpert, J. B. Christensen, Ruth Henderson, H. C. Pierpont

GENERAL INFORMATION

INTRODUCTION

The School of Medicine of The George Washington University was opened in March 1825. Of the medical schools now in existence in the United States, it is the eleventh in chronological order of founding. The University Hospital and Dispensary were established in 1898 as a part of the organization of the School. The present George Washington University Hospital was opened in 1948, and the Helen L. and Mary E. Warwick Memorial Building housing the Cancer Clinic was completed in 1954. Additional clinical facilities are used at the District of Columbia General Hospital, Children's Hospital, St. Elizabeths Hospital, and Mt. Alto Veterans Administration Hospital. The School of Medicine maintains close affiliation not only with the various divisions of the University, but also with the numerous medical research and scientific establishments of the Federal Government in the Nation's Capital. Washington provides world renowned library facilities, comprehensive museums, and excellent recreational facilities which are available to students.

OBJECTIVES

The purpose of the School of Medicine is to prepare men and women in the art and science of medicine to meet the health needs of a growing, ever changing society. It is the responsibility of the School of Medicine to provide its students with a systematic plan of instruction in the basic medical sciences, with well guided clinical experience, with opportunities for expression in research, and with a philosophy in keeping with the highest ethics of the profession.

To achieve these objectives the School of Medicine has developed a progressive plan of instruction and a balanced, comprehensive curriculum. To carry out the program the University maintains a faculty of adequate size and of outstanding ability and makes use of facilities which provide exceptional opportunities for research and clinical training.

PLAN OF INSTRUCTION

The curriculum is a progressive one, beginning with basic medical science and expanding to include the more complex aspects of the prevention of disease and care of the sick. The teaching program is organized under the various departments of the School of Medicine. (See "Courses of Instruction".)

The schedule for the first year begins with an orientation week designed to introduce the new students to the Faculty, to the upperclassmen, and to the environment for their medical education. The students meet for informal panel discussions with upperclassmen and members of the Faculty on such subjects as curriculum, medical terminology, use of library facilities, ethics and aims of the medical profession, and student health.

First year instruction is given in anatomy, biochemistry, and physiology using the classroom and laboratory facilities of the School of Medicine. Early in their medical careers students are encouraged to participate in research.

Having completed the preliminary study of structure and function of the normal body, the student progresses in the second year to a consideration of disease processes and mechanisms. The various microbial agents capable of causing disease are studied in the course in microbiology, and the effect of these and other harmful substances upon the body are studied in the course in pathology. The modes of action of various therapeutic agents are considered in the course in pharmacology. Introductory lectures and demonstrations in the clinical sciences are given during the second semester in order to prepare the student for the responsibilities of the following year.

In the third year the student is assigned to the University Hospital and affiliated hospitals for lectures, conferences, and clinical studies. He serves in the various divisions of the hospital assisting in the preparation of clinical records and performing certain clinical laboratory examinations. He learns to apply diagnostic and therapeutic procedures in the care of patients. During this period instruction is individual or in small groups. The instructor reviews the student's observations at the bedside and guides him in the development and application of his knowledge.

During the following summer each fourth year student is required to spend eight weeks in one of the clinical facilities of the School of Medicine. In the fourth year the student's responsibility for inpatient care continues and enlarges, but at least an equal part of his time is spent in the study and care of clinic patients. The University Hospital, the District of Columbia General Hospital, Children's Hospital, Mount Alto Veterans Administration Hospital, and St. Elizabeths Hospital provide the students with experience in many fields. In this final year of formal medical education stress is placed upon the total patient and his environment so that emotional and economic as well as physical factors may be considered in the restoration of the individual to a state of health and happiness.

Upon satisfactory completion of the four-year course of the School of Medicine, the student is well prepared for graduate training leading to a career in general or specialty practice, research, medical education, or government service.

THE CURRICULUM

Subject	Lecture	Laboratory or Clerkship	Conference	Total
First Year				
Anatomy				656
Biochemistry	64	192	32	288
Physiology	64	192	32	288
Disaster Medicine	16	—	—	16
Psychiatry	32	—	—	32
Total				1,280

Second Year

Subject	Lecture	Laboratory or Clerkship	Conference	Total
Microbiology	64	144	16	224
Pathology	64	136	32	232
Pharmacology	40	80	24	144
Physical Diagnosis	16	96	—	112
Psychiatry	32	48	—	80
Clinical Microscopy	16	32	—	48
Medicine	48	—	—	48
Surgery	32	—	—	32
Community Health	32	—	—	32
Pediatrics	32	—	—	32
Neurology	32	—	—	32
Obstetrics and Gynecology	16	—	—	16
Radiology	16	—	—	16
Forensic Pathology and Medical Jurisprudence	16	—	—	16
Dermatology	16	—	—	16
Total	472	536	72	1,080

Third Year

Subject	Lecture, Conference or Clinic	Laboratory or Clerkship	Total
Anesthesiology	16	—	16
Clinical Pathological Conference	16	—	16
Medicine	64	240	304
Medical Laboratory	—	60	60
Neurology	16	60	76
Obstetrics and Gynecology	96	120	216
Ophthalmology	16	—	16
Pediatrics	32	120	152
Physical Medicine	16	—	16
Psychiatry	16	—	16
Radiology	16	—	16
Surgery	112	240	352
Otolaryngology	16	—	16
Admitting and Emergency	—	120	120
Therapeutic Conference	32	—	32
Urology	16	—	16
Total	480	960	1,440

Summer Clerkship

Medicine, Surgery, Obstetrics and Gynecology *or* Pediatrics—eight weeks between third and fourth years.

FOURTH YEAR

Subject	Lecture, Conference or Clinic	Laboratory or Clerkship	Total
Cancer Clinics	—	120	120
Clinical Pathological Conference	28	—	28
Forensic Medicine	12	—	12
Medicine	—	360	360
Obstetrics and Gynecology	—	240	240
Pediatrics	28	240	268
Psychiatry	—	120	120
Public Health Practice	5	—	5
Surgery	—	360	360
Surgical Anatomy	15	—	15
Surgical Pathology	12	—	12
Total	100	1,440	1,540

EQUIPMENT AND FACILITIES

Medical School Building.—The building housing the School of Medicine is a five-story structure with lecture rooms, classrooms, students' rooms, and the following laboratories: anatomy; biochemistry; microbiology; pathology; pharmacology; and physiology.

They are fully equipped to enable students to pursue adequately the laboratory courses and to acquire the technical skill necessary in modern clinical and investigative work.

Research and Administration Building.—The Research Building houses special laboratories for graduate and staff research in the departments of Anatomy; Biochemistry; Microbiology; Pharmacology; and Physiology. Special facilities are provided for the study of radioactive compounds, for tissue-culture techniques, and virologic procedures. Selected students are invited to participate in certain aspects of the research program either on a volunteer basis or with the support of special Research Scholarships.

On the first floor, the west wing is occupied by a modern medical library; the east wing houses the administrative offices of the School of Medicine. Photographic laboratories and other facilities for audiovisual aids to education are on the second floor.

Medical Library.—The Medical Library in well-equipped quarters on the first floor of 1339 H Street NW., contains 24,500 carefully selected volumes, including the new medical works and the principal medical journals.

Interlibrary loan service is maintained with other medical and scientific libraries.

The Medical Library is open from 9:00 A.M. to 10:00 P.M. each class day, Monday through Friday, and from 9:00 A.M. to 5:00 P.M. Saturday.

A branch of the Medical Library is maintained in the University Hospital for the use of the resident physicians, interns, and students. It is open Monday through Friday, 1:00 to 5:00 P.M. and 6:00 to 11:00 P.M. During the academic year the library is also open Saturday and Sunday from 1:00 to 5:00 P.M.

The George Washington University Hospital.—This 425-bed hospital is staffed and directed by the Faculty of The George Washington University School of Med-

icine. It provides excellent clinical opportunity for the instruction of medical students. Specialties in the fields of medicine and surgery have assigned space and equipment for the diagnosis and care of ambulatory and hospital patients.

Government Museums

The Armed Forces Institute of Pathology, on the grounds of Walter Reed Army Medical Center, affords unexcelled opportunity for study of conditions met in general medicine and surgery as well as those of special military significance. Its collection of anatomical and pathological specimens comprises material received from all areas of the world and is unequaled in this country. The Museum of Hygiene, the National Museum, the Smithsonian Institution, the Botanic Gardens, and the various collections of the Department of Agriculture all afford opportunity for study of materials of special interest in various areas of Medicine and its allied sciences.

CLINICAL FACILITIES

Students at The George Washington University School of Medicine receive clinical training at the University Hospital, at the University Cancer Clinic, and at affiliated hospitals.

The George Washington University Hospital.—The Medical Director and Chiefs of Services are responsible for the supervision of patient care. The individual student has direct responsibility to patients under supervision. Clinical and clinical pathological conferences are held in which the history of patients, laboratory records, and the physical and pathological findings are presented and correlated.

The University Clinics.—The University Clinics have facilities for each Service in the Hospital. Fourth-year students are assigned in rotation by section for instruction in the University Clinics.

The George Washington University Cancer Clinic.—The Helen L. and Mary E. Warwick Memorial Building, opened in 1954, houses the Cancer Detection Clinic and special laboratories for research related to the nature, diagnosis, and treatment of cancer.

The facilities of the Cancer Detection Clinic are used for teaching medical students. The diagnosis and treatment of various forms of neoplasms are presented. The results of treatment are evaluated by follow-up studies.

District of Columbia General Hospital.—The District of Columbia General Hospital, one of the ten largest general hospitals in the country, is a teaching facility for students of the School of Medicine.

The hospital has a bed capacity of approximately 1,400. It is the principal facility for the care of the indigent sick of the community. In 1960 the outpatient department had over 110,000 clinical visits. Approximately 200 patients are registered daily in the admitting and emergency service, of whom from 15 to 20 per cent are admitted to the Hospital. This is the largest emergency service in the District, and a great variety of acute medical problems and surgical cases are examined and treated. From 35 to 40 per cent of the patients are referred to the outpatient clinics for further diagnosis and treatment.

Children's Hospital.—This is one of the largest and best known hospitals for children in the United States. Medical students receive training and clinical ex-

perience in pediatrics on both clinic and inpatient services. Special lectures and clinical work in child psychiatry are given in Children's Hospital.

St. Elizabeths Hospital.—Saint Elizabeths Hospital, established by an act of Congress in 1855, is a federal psychiatric hospital administered under the Department of Health, Education, and Welfare. This Hospital provides for the treatment, care, and general well-being of approximately 8,000 patients. The facility includes a completely approved General Hospital to meet the needs for medical and surgical care and which functions with a full-time staff within the Hospital plus attending physicians in various specialties.

The Hospital maintains an up-to-date medical library.

The medical students of The George Washington University utilize the facilities of Saint Elizabeths for clinical psychiatric training.

The opportunities for research are enhanced by a cooperative arrangement with the National Institute of Mental Health of the United States Public Health Service.

Mt. Alto Veterans Administration Hospital.—This 335-bed hospital, commonly referred to as Mount Alto, is predominantly general medical and surgical, although 33 beds are reserved for the care of neurological and psychiatric patients.

The Hospital is equipped and operates with all modern facilities for care and treatment of patients, including a fully equipped medical library. In addition to its medical, surgical, neurological, and psychiatric facilities, the Hospital is designated to perform specialized treatment in a wide variety of fields. The psychiatric evaluation headquarters staff is located at this Hospital and has as its mission the investigation and evaluation of the psychiatric treatment program in the VA. The Hospital also has personnel assigned to, and cooperates closely with, the Armed Forces Institute of Pathology.

Fairfax Hospital.—This 300-bed suburban hospital which opened February 1961, is a teaching hospital serving an area with an estimated population of 300,000. In addition to its modernly equipped emergency room, outpatient facilities, surgical suites and delivery rooms, and private psychiatric unit, programs are offered for the training of nursing personnel.

ADMISSION, REGISTRATION, FEES AND FINANCIAL REGULATIONS

Students in the School of Medicine are subject to, and are expected to familiarize themselves with, the regulations stated on pages 8–23.

Registration in the School of Medicine *is for the full academic year.* After the student has entered the courses of instruction he is obligated for the full tuition. Acceptance by the School of a student's fee does not in any way obligate the School to accept the student for any subsequent year, and the right is reserved to require the withdrawal of any student from the School whenever, in the interest of the student or the School, the Faculty deems it advisable to do so.

A fee of $10 to defray the costs of completing the records for final consideration by the Committee on Admissions must accompany each application. This fee applies to students whose premedical training was completed at this University as well as to students who have not previously attended this University. Fees for each semester are payable in advance.

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed on invitation by the Committee.

Each applicant is notified of the Committee's decision as soon as possible.

An applicant who is offered a place in a class is required, within two weeks, to notify the Director of Admissions of his intent to accept the place reserved for him. A deposit of $100 must be remitted not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Director of Admissions by the student's physician within two months of receipt of the letter of acceptance.

Credit for work will not be given until, at the completion of a laboratory course, the student has replaced or paid for all articles of equipment or other University property which he has lost, broken, or destroyed.

Cost of Textbooks and Student Equipment

The minimum cost of necessary textbooks and student equipment (microscope, drawing materials, glass slides, clinical thermometer, stethoscope, hemocytometer, uniforms, etc.) is approximately as follows: first year, $600; second year, $275; third year, $150; fourth year, $100; total $1125.

A fee of $1 a semester is charged for the use (optional) of a locker.

REGULATIONS

Attendance

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required.

Grades

A—excellent; *B*—good; *C*—passing; *D*—condition; *F*—failure; *I*—incomplete. The passing grade in each subject is *C* or above.

The symbol *I* indicates that the required work of the course has not been completed for reasons acceptable to the Dean. An "incomplete" must be removed by arrangement with the department concerned before the student may advance to the work of the following year.

A student receiving a grade of *D* or *F* in any subject may not advance to the work of the following year until he has complied with such recommendations of the Committee on Scholarship as are approved by the Faculty.

Physical Examinations

All first-year students are required to have a comprehensive physical examination prior to admission to the School of Medicine. The students are informed of significant findings and advised regarding such measures as will tend to help them maintain a high standard of health.

In addition medical students benefit from the complete Tuberculosis Case Finding Program which the School maintains. Under this program all students receive tuberculin tests, X-ray examinations, and such special attention from chest specialists as is necessary to reduce to a minimum the dangers from tuberculosis. Students are immunized against those diseases for which proven prophylaxis exists.

THE DEGREE OF DOCTOR OF MEDICINE

Upon the satisfactory completion of the requirements of the School of Medicine, the degree of Doctor of Medicine is conferred.

Combined Arts and Medicine Curriculum

In order to be recommended for the degree of Bachelor of Arts, the candidate must complete at least 90 semester hours of prescribed college work (at least 30 hours and one year of residence must be completed in Columbian College of Arts and Sciences) and the first year of the medical curriculum. Upon satisfactory completion of the fourth year of the medical curriculum the student becomes eligible for the degree of Doctor of Medicine.

REQUIREMENTS FOR THE DEGREE

Every candidate for graduation with the degree of Doctor of Medicine must be at least twenty-one years of age, and free of all indebtedness to the University. He must have completed satisfactorily not less than four academic years of study as a matriculated student in Medicine, completed all required courses, and passed satisfactorily all prescribed examinations.

Honors

A candidate who has completed the four-year medical course with a quality-point index of 3.50 or above, may be recommended by the Faculty for graduation "with distinction."

INTERN PROGRAMS

For 1962–63, the University Hospital will offer the following internships, classified by the National Intern Matching Program, Inc.: eight straight internships in Internal Medicine, eight mixed internships with Internal Medicine as the major component, twelve mixed internships with Surgery as the major component, and two straight internships in Pathology.

RESIDENT PROGRAMS

Fifty-five approved residencies are offered in anesthesiology, cardiac diseases, internal medicine, neurologic surgery, neurology, obstetrics-gynecology, orthopedic surgery, pathology, physical medicine, plastic surgery, psychiatry, roentgenology, surgery and thoracic surgery. Residency programs are from one to four years in duration, depending upon the service. Residents in the University Hospital also receive appointments as members of the faculty of the School of Medicine with active teaching responsibilities.

FELLOWSHIP PROGRAMS

Fellowships, through the School of Medicine, of one or two years are available in anesthesiology, cardiology, chest diseases, gastroenterology, hematology, infectious diseases, metabolic diseases, outpatient service, physical medicine, renal diseases, rheumatic disease, surgery and thoracic surgery.

All appointments are for one year with the privilege of applying for continuation on the House Staff. In several of the intern, residency, and fellowship programs, excellent affiliations are maintained with local and governmental hospitals. Inquiries and applications for internships and residencies should be addressed to the Chief of the Department or to the Medical Director; The George Washington University Hospital, 901 23rd Street, NW., Washington 7, D. C.

Information relative to fellowships may be obtained from the Chief of the Department concerned or from the Director of Postgraduate Medical Education, in care of the Hospital.

MEDICAL TECHNOLOGY COURSE

This course is open to candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College of Arts and Sciences, and to the other applicants meeting the requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists. These requirements, fully satisfied by the Columbian College program, consist of 3 years (90 semester hours or 135 quarter hours) of college work in any college or university accredited by a recognized standardizing association, including certain specific courses in the science field. The specific science requirements are as follows: *Chemistry*—a minimum of 4 semesters or 6 quarters (16 semester hours or 24 quarter hours) of studies acceptable toward a major in chemistry and including lecture and laboratory; *Biologic Sciences*—a minimum of 4 semesters or 6 quarters (16 semester hours or 24 quarter hours) of studies acceptable toward a major in biologic science and including lecture and laboratory; *Mathematics*—a minimum of 3 semester hours or 4 quarter hours of college mathematics.

For students enrolled in Columbian College of Arts and Sciences as candidates for the degree of Bachelor of Science in Medical Technology, the Medical Technology Course constitutes the final (fourth) year of qualification for the degree.

In the case of those who have taken their prerequisite work in some other college or university, satisfactory completion of the Medical Technology Course will not satisfy the requirements for the degree from Columbian College.

The Medical Technology Course consists of 12 months of didactic and practical work in clinical laboratory procedures, offered by the Department of Pathology in the University Hospital. Students ordinarily begin this course with the fall semester, but under exceptional circumstances may begin at other times.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. (See page 31.) All students in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital. A cash allowance of $65 a month is granted during the last 6 months of the fourth year in training.

Upon satisfactory completion of the course a certificate is awarded and the candidate is eligible for the national certifying examination given by the Registry of Medical Technologists.

Enrollment in the Medical Technology Course is strictly limited so that personal instruction can be given. Acceptance to the Columbian College degree program does not necessarily assure acceptance into the Hospital program. Inquiry about this course should be sent directly to the Department of Pathology, The George Washington University Hospital, Washington 7, D. C.

THE NATIONAL LAW CENTER

Established in 1959, the National Law Center seeks, as an integral part of a University, to establish and coordinate programs of teaching, research, and creative development in law which will assist the profession to meet the demands placed upon it by contemporary society. The Center consists of two separate but closely related schools: the Law School and the Graduate School of Public Law. Emphasizing an interdisciplinary approach to modern social, political, scientific, and economic problems having legal implications, the Center also encourages close relations with other appropriate units of the University.

GENERAL INFORMATION

Day and Evening Divisions

Most day classes meet for fifty-minute periods between 9:10 A.M. and 1:00 P.M., Monday through Friday; Trial Practice Court meets for two-hour periods on Saturday morning.

Evening classes meet for two fifty-minute periods from 5:50 to 7:40 P.M., Monday through Friday. A four-credit course, e.g., Torts, meets two evenings a week; a three-credit course, e.g., Administrative Law, meets two evenings a week for one half the semester and one evening for the other half; a two-credit course, e.g., Personal Property, meets one evening a week. The evening division conforms to the standards of the morning division, the full-time faculty participating in the instruction.

The Library

The Law Library of 58,000 volumes contains the official reports of the decisions of the courts of last resort of all states prior to the National Reporter System, and of some states complete to date; the National Reporter System, complete; the reports of the United States Supreme Court and lower federal courts, and the reports of federal administrative agencies; Shepard's Citations for the units of the Reporter System; the English Reports, Full Reprint; the English Law Reports; the Times Law Reports; the Dominion Law Reports; the United States statutes and codes; complete sets of statutes of all the states; the English statutes; the principal English and American digests and encyclopedias; collections of special reports and annotated cases; United Nations documents; and leading textbooks and treatises. Approximately 335 legal periodicals are currently received. A section of the library, consisting of books acquired from National University, is known as the National University Law Collection.

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card issued upon the payment of fees, must be presented as identification.

Also available to law students are 50,000 bound volumes and 20,000 pamphlets of the former library of the Carnegie Endowment for International Peace, in the fields of international law and relations, history, and economics, in the University Library.

The Law Library, which is on the fourth floor of Stockton Hall, is open from 9:00 A.M. to 10:00 P.M., Monday through Friday; from 9:00 A.M. to 5:00 P.M. on Saturday; and from 2:00 to 6:00 P.M. on Sunday. Books and other materials do not circulate and must be used in the library.

REGULATIONS

Regulations concerning Admission, Registration, Fees and Finances *are stated on pages 8–23; other University regulations, on pages 39–45.*

Amount of Work

Students without substantial outside employment may take a program of studies of 14 hours a week. Such students may take courses in the evening only if they are not available in the daytime and if a majority of the hours taken are in day courses. Students with 20 hours or more of outside employment whether in the day or evening division, must take a limited program of studies not exceeding 10 hours a week. Students taking a majority of their classes in the evening may not take more than 10 hours a week; the minimum load is 8 hours, except in special cases where 6 may be approved for a limited time. A minimum schedule of 10 hours in the day division is required except in exceptional circumstances when a reduced program is authorized by the Dean for continuing students.

Attendance

Regular attendance at classes is required and is necessary for successful work. A student who is deficient in class attendance in any course may be barred from taking the examination, and the course must be repeated.

Examinations

Written examinations are held at the end of each course. Every student is required to take the regular examinations unless excused. No excuse for absence will be granted except by the Dean and then only for illness or other emergency. Application for excuse must be made in writing not later than one month after the date of the examination. An entry of *I*, incomplete, will be made on the record of a student thus excused. To receive credit for the course, he must take the next regularly scheduled examination. The examination may not be taken after exclusion for low scholarship.

Permission to take an examination before the regularly scheduled date will not be granted. Permission to take a postponed examination is limited to the situation provided for in the preceding paragraph.

A special examination will be granted only to a student entitled to take a postponed examination, who is a candidate for a degree to be conferred at a convocation which precedes the next regular examination in the subject. Written application, showing sufficient cause, should be addressed to the Dean, and approval will be granted at the discretion of the Faculty.

If a student fails to take an examination, a grade of zero will be recorded unless he has been excused from the examination as provided above or has obtained the Dean's permission to drop the course.

Grades

Grades are given in numerical terms which are equivalent to letter grades according to the following scale: 85–100, *A*, excellent; 75–84, *B*, good; 65–74, *C*, satisfactory; 55–64, *D*, poor—below standard for graduation; below 55, *F*, failure. A student who has been excused from failure to take a regularly scheduled examination is given the grade of *I*, incomplete, and a student who has been barred from taking an examination because of excessive absences is given the grade of *EA*. See "Examinations" above, for grade upon failure to take an examination. Grades between 65 and 100 indicate that the work has been completed and credit given for the courses. Grades between 55 and 64, however, do not represent satisfactory work and

adversely affect a student's cumulative average. No credit is given for grades below 55.

A student may not repeat a course he has failed, except by permission of the Faculty.

The cumulative average of a student includes all grades in all courses taken while he is a candidate for a particular degree. When a course is repeated, both the first grade and the subsequent grade or grades are counted in the cumulative average.

Exclusion and Probation for Poor Scholarship

Candidates for the Degrees of Bachelor of Laws and Juris Doctor.—A student will be excluded who fails in courses aggregating 8 or more semester hours in one semester or in two successive semesters, or who fails in courses aggregating 10 or more semester hours during his period of law study. A student subject to exclusion under this provision who is currently registered will be permitted to complete the work of the semester.

A student not subject to exclusion under the foregoing rule who at any time fails to maintain a cumulative average of at least 65 will be placed on probation. A student on probation may at the discretion of the Dean be required to reduce his program of study. If a student on probation does not, by the end of the second semester following that in which his average has fallen below 65, receive grades sufficient to give him a cumulative average of at least 65, he will be excluded. If a student on probation attains a cumulative average of at least 65 by the grades received during the semester his status will then become clear. A maximum of three semesters of probation is allowed. Thus, if a student whose status has become clear after two semesters of probation subsequently goes on probation, he will be allowed only one semester of probation in which to raise his average to at least 65.

In special cases in which a student who has been excluded can clearly demonstrate that his low grades were due to special circumstances beyond his control and that he has the capacity to pursue the study of law with a definite likelihood of success, such student may be readmitted by the Faculty subject to such conditions as the Faculty may impose.

Candidates for Graduate Degrees.—A candidate for one of the graduate degrees whose work is not satisfactory in the opinion of the Faculty, taking into consideration the requirements and standards for the degree, may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Unclassified Students.—An unclassified student whose work is not satisfactory in the opinion of the Faculty may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Placement Service

The Law School takes a continuing interest in the placement of its graduates in private practice and governmental service, as well as with industry and commerce. The Dean, the Faculty, and the University Placement Office cooperate in collecting information from alumni, law firms, and government agencies concerning opportunities in legal positions throughout the country. Senior law students and recent graduates are urged to keep in touch with the Law School Placement Office.

THE LAW SCHOOL

THE FACULTY AND STAFF OF INSTRUCTION*

C. B. Nutting, *Dean of the National Law Center;* Robert Kramer, *Dean of the Law School;* C. D. Benson, *Assistant Dean of the Law School;* E. A. Potts, *Assistant Dean for Development in the National Law Center*

Professors C. D. Benson, O. S. Colclough, R. M. Cooper, J. F. Davison, R. G. Dixon, Jr., W. T. Fryer, Robert Kramer, W. T. Mallison, Jr., L. H. Mayo, L. S. Merrifield, A. S. Miller, C. B. Nutting, O. H. Walburn, D. B. Weaver†, G. E. Weston

Adjunct Professor J. W. Jackson

Professorial Lecturers E. A. Beard, J. L. Edgerton, L. J. Harris, G. L. Hart, Jr., Murdock Head, P. F. Herrick, J. A. McIntire, G. E. Monk, Lester Nurick, G. N. Robillard, W. S. Surrey, L. P. Walsh, C. J. Zinn

Associate Professors M. H. Freedman, D. C. Green, J. R. Hambrick, W. W. Kirkpatrick, G. A. Ledakis, R. C. Nash, Jr.

Associate Professorial Lecturers T. H. Brown, G. J. Goldsborough, H. J. Liebesny, P. A. Rose

Assistant Professors W. J. Baker, J. J. McAvoy, D. E. Seidelson, D. J. Sharpe, J. P. Sullivan, R. J. Temple

Lecturers G. C. Cary, M. F. Cohen, S. S. Cohen, W. W. Goodrich, H. P. Green, A. H. Kaplan, E. A. Potts, I. H. Rimel

Clerk of the Trial Practice Court J. A. Kendrick

Associate Clerk of the Trial Practice Court D. G. Skinker

HISTORY

The Law School, the oldest in the District of Columbia, was established in 1865 with a formal program of two years of study. This was largely through the efforts of the Reverend George Whitefield Samson, President of Columbian College, whose action resulted in the purchase of a separate building for holding law classes. This building had belonged to Trinity Church of which Francis Scott Key had been Senior Warden. It was occupied by the Law School until 1884.

Sixty graduates, from twenty-two of the then thirty-seven states, received degrees in 1867. The School continued to have a student body and a faculty which reflected the fact that it was at the seat of our nation's government. Associate Justices David J. Brewer and John Marshall Harlan of the Supreme Court of the United States were among the prominent members of the bench and bar who served as lecturers.

In 1877, one year after the first such program was adopted in the United States, the Law School instituted a course leading to the degree of Master of Laws. In 1898 the course of instruction for the degree of Bachelor of Laws was extended to three years. The School took part in 1900 in the organization of the Association of American Law Schools. Later women students were admitted and in 1916 the first woman to take a regular course in law was graduated.

The Law School moved into its present quarters in 1925, marking the occasion with

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* The President of the University, the Dean of Faculties, the Dean of the National Law Center, the Dean and Assistant Dean of the School, the Assistant Dean for Development in the National Law Center, the Registrar of the University, the Director of Admissions of the University, Professors, Adjunct Professors, Associate Professors, and Assistant Professors constitute the Faculty.
This listing of the Faculty and Staff of Instruction is for the academic year 1961–62.

† On leave of absence 1961–62.

a dedicatory address by Dean Roscoe Pound. The building, Stockton Hall, is named for Rear Admiral Charles H. Stockton, President of the University from 1910 to 1917.

In the past quarter-century the Law School has developed its course and seminar offerings with consideration for the needs of first-degree and graduate students. The degree of Doctor of Juridical Science was instituted in 1940. The needs of foreign lawyers who come to this country and who require additional preparation for law work in the United States resulted in the creation of programs for the degrees of Master of Comparative Law in 1946 and Master of Comparative Law (American Practice) in 1951.

National University, which had had an important place in legal education in the District of Columbia since 1869, was merged in The George Washington University in August 1954.

Programs of special research and study, such as the independent Patent, Trade-Mark, and Copyright Foundation, give richness to the basic curriculum of the Law School.

LOCATION IN THE NATION'S CAPITAL

Of special significance is the location of the Law School in the Nation's Capital, the focal point of the law in action, both American and international. The work of the School goes on in this environment, presenting a unique opportunity for observation and study of federal agencies—judicial, legislative, and administrative.

The years of residence at law school are years of participation in the life of the community, which in the case of The George Washington University Law School, is the government of the United States. As a consequence, the study of law takes on added meaning, whether the goal be government service or practice, general or specialized, and whatever the community in which the student plans to practice.

OBJECTIVES

The primary purpose of the Law School is to prepare men and women to meet the needs of society in the many fields of law, public and private. These needs call not only for technical skill but also for responsible leadership in the development of the law and the administration of justice. In fulfilling these responsibilities the Law School offers: (1) a program of study in preparation for the practice of law; (2) programs of study and research on the graduate level for foreign as well as for American students; (3) a continuing legal education program for members of the bar, (4) institutes and forums on current topics in domestic and foreign law; (5) the publication of a law journal containing the results of research in public law; and (6) the encouragement of student professional co-curricular activities.

THE BACHELOR OF LAWS PROGRAM

The wide geographical distribution of the students who come to the Nation's Capital to study law makes for a truly national law school. Students from almost every state in the Union here join students from several foreign countries in their legal training. The basic curriculum leading to the Bachelor of Laws degree is addressed to the development and application of legal principles, skills, and ideals which are indispensable to the equipment of a lawyer for professional responsibility and leadership in modern society. It includes, first and foremost, the traditional core of legal education, namely, the study of legal materials—judicial, statutory, and administrative—and instruction in the understanding and technique of their use. It also includes the study of the nature and purpose of law, the history of the Anglo-American

legal system, and the history and standards of the legal profession; practice in the skills of legal research and legal writing; elementary training in trial and appellate practice; and, through the medium of seminars, experience in group handling of legal problems.

Entering Classes

The curriculum is organized so that students may enter the Law School at the beginning of the fall or spring semester of the academic year, but not at the beginning of the summer term.

The Law Review

The George Washington Law Review, published by the University, is edited and managed by students of the Law School under the supervision of faculty advisers. It is devoted exclusively to state and federal public law. The location of the University in the National Capital, where the primary sources of federal public law may be observed in operation, affords an unexcelled opportunity for specialization in this field.

The student staff participates in a two-year *Law Review* program. The editorial staff is selected from among those students who have successfully completed the first year of *Review* work. Students receive four hours of academic credit for the two-year program.

The Student Bar Association

Every student in the Law School is a member of the Student Bar Association, which is organized to enable students to become better acquainted with problems of the profession, to foster professional ideals, and to bring about closer contact with members of the profession engaged in active practice of the law. The work of the Student Bar Association is carried on by various committees and by group and general meetings of a professional and social nature. From time to time lectures are given by outstanding authorities on legal and professional problems.

An important activity is the Van Vleck Case Club Competition, which provides an opportunity for training in appellate advocacy. First and second year students participate as contestants before courts composed of members of the Faculty and the local bar. Senior law students of the Case Club also sit as judges. The final argument is held before a court composed of distinguished federal judges.

The Legal Aid Program is under the joint sponsorship of The George Washington University Student Bar Association and the Junior Bar Section of the District of Columbia Bar Association. Participating students assist court-appointed attorneys in the preparation of cases for trial or appeal. Qualified second- and third-year students are eligible for participation in the program.

In the ranking of member associations by the American Law Student Association, The George Washington University Student Bar Association has received first place twice and second place twice in the past six years.

Order of the Coif

The Order of the Coif, a national honor society with chapters in over forty law schools, aims "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." The George Washington University Chapter was established in 1926. Members are elected each year from the highest-ranking 10 per cent of the graduating class of the Law School.

Classification of Students

Candidates for the degree of Bachelor of Laws are divided into classes on the completion of semester hours as follows: (1) full-time students: first year, 1–28; second year, 29–56; third year, 57 or more; (2) part-time students: first year, 1–20; second year, 21–40; third year, 41–60; fourth year, 61 or more.

Unclassified Students

A degree candidate in good standing at another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student to earn credits for transfer to the other law school.

REQUIREMENTS FOR THE DEGREES*

To be recommended for the degree of Bachelor of Laws (LL.B.) the student must have completed a residence period of not less than three academic years (four years for evening students) and 80 semester hours of required and elective courses, with a cumulative average of at least *C*. At least one academic year of residence and 28 semester hours are required of students admitted with advanced standing. Credits allowed by way of advanced standing are not included in computing the average required for graduation.

Honors

The degree of Bachelor of Laws "with distinction" is awarded students who obtain a minimum cumulative average of 85.

Residence

Candidates for the degree of Bachelor of Laws must complete a residence period of three academic years. Attendance in the day division for the fall and spring semesters constitutes residence for an academic year; similar attendance in the evening division constitutes residence for three-fourths of an academic year. Consequently, a day student must attend 6 semesters to meet residence requirements, an evening student must attend 8. Students authorized to take schedules of less than 10 hours in the day division or less than 6 hours in the evening division receive residence credit on a proportional basis. Students who attend the summer sessions receive fractional residence credit. For details, see page 41.

Curriculum

Required and Elective Courses.—A program of required and elective courses has been developed to assure coverage of the basic courses and allow a degree of flexibility to meet the diverse interests of students. All first-year courses, four second-year courses, and one third-year course are required, leaving a total of 35 hours of electives. In general, second-year students are restricted to second-year electives but in appropriate cases the taking of third-year electives will be approved. Similarly, specially qualified third-year students may secure approval to take graduate courses and

* The degree of Juris Doctor (J.D.) is conferred as a recognition of the completion at The George Washington University Law School, with high rank, of the required program of study for the Bachelor's degree, including experience in research and legal authorship. To be recommended for this degree the student must have completed: (1) a residence period of not less than three academic years (four years for evening students); (2) 80 semester hours with a cumulative average of at least *B* including one of the following courses: Comparative Law I, Jurisprudence, or one of the graduate seminars; and (3) one year of acceptable service on the board of student editors of *The George Washington Law Review*, election to which is subject to regulations laid down by the Faculty. All requirements for the degree must be completed at this Law School.
This degree is available only to students who entered the Law School prior to September 1961.

research in public law. It is important that students plan ahead regarding their electives.

Practice and Trial Practice Court.—Classroom instruction is conducted in pleading and procedure, trial and appellate practice, and evidence. This instruction includes grounding in the principles of the Federal Rules of Civil Procedure and the Federal Rules of Criminal Procedure. In addition, each senior student is required to participate in the work of the Trial Practice Court, which includes the trying of cases as junior counsel and as senior counsel. A special section of the court is devoted exclusively to the trial of patent cases. Experience in preparing and arguing appellate court cases is available through the course in Appellate Practice and Procedure and the Case Club Competition.

Patent Law.—Students interested in patent law should take the following group of courses: Unfair Trade Practices, Patent Law, Patent Office Practice, Patent Trial Practice Court, and Federal Antitrust Laws. Additional courses recommended are Advanced Topics in Patent Law and Trade Regulation Seminar.

Curriculum.—Following is the curriculum for students beginning in the fall semester. Adjustments are made to meet the needs of students beginning in the spring semester.

Day Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Constitutional Law	4
Legal Method and Legal System	4	Contracts II	2
Personal Property	2	Criminal Law and Procedure	4
Torts	4	Real Property	4
Total	14	Total	14

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Administrative Law	3
Conveyances	2	Evidence	4
Electives	8	Electives	7
Total	14	Total	14

THIRD YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Trial Practice Court	2	Trial Practice Court	2
Electives	10	Electives	10
Total	12	Total	12

Evening Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Contracts II	2
Legal Method and Legal System	4	Criminal Law and Procedure	4
Personal Property	2	Torts	4
Total	10	Total	10

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Constitutional Law	4
Real Property	4	Conveyances	2
Electives	2	Electives	4
Total	10	Total	10

THIRD YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Administrative Law	3	Evidence	4
Electives	7	Electives	6
Total	10	Total	10

FOURTH YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Trial Practice Court	2	Trial Practice Court	2
Electives	8	Electives	8
Total	10	Total	10

THE GRADUATE SCHOOL OF PUBLIC LAW*

C. B. Nutting, *Dean of the National Law Center;* L. H. Mayo, *Dean of the Graduate School of Public Law*

Professors L. H. Mayo, J. F. Davison, R. G. Dixon, Jr., Robert Kramer, L. S. Merrifield, A. S. Miller, C. B. Nutting, G. E. Weston
Associate Professor R. C. Nash, Jr.

HISTORY

The general concept of a graduate school of public law in the City of Washington goes back at least as far as World War II, when a group of law teachers then in government service discussed the matter on several occasions. The idea was revived some years later when the Trustees of The George Washington University adopted a resolution commending "the Law Center as being worthy of the strong support of the entire University . . . and of all those who believe that the Law Center offers an opportunity for service of the highest order." During succeeding years the concept was further refined and it was determined that the Center should include a Graduate School of Public Law with its own dean and faculty. In 1959 the Trustees established the School.

OBJECTIVES

The Graduate School of Public Law shares the general objectives of the Law School. More specifically, its objectives are: (1) to provide a flow of men and women, educated in the law, who will be more effective in dealing with both present day and emerging problems, national and international, involving law and government and (2) to provide means for continuing critical and objective analysis of such problems and to contribute to their resolution. In so doing it offers instruction lead-

* The President of the University, the Dean of Faculties, the Assistant Dean for Development in the National Law Center, the Registrar of the University, and the Director of Admissions of the University are members ex officio of the Faculty.

ing to graduate degrees as well as programs of continuing legal education and conducts research in areas involving law and government and their relationship to the problems of society.

PROGRAMS OF STUDY

Degrees of Master of Laws and Doctor of Juridical Science

The administration of justice under law is a matter so vast and complex that some graduates feel the need for further study to broaden and deepen their understanding of the law. Others wish to extend their study into rapidly developing specialized fields. Graduate instruction, leading to the degree of Master of Laws enables qualified students to attain one or both of these objectives.

The degree of Doctor of Juridical Science is offered for selected students whose aim is to extend still further their studies by pursuing original research in law.

Graduate work is available to evening as well as day students for the convenience of lawyers in private practice and in government service.

Continuing Legal Education

An important part of the graduate program is the offering of courses in various fields of the law for members of the bar not interested in degree candidacy but desirous of keeping abreast of current developments. The offerings in the field of governmental regulation provide opportunities for specialization. Although third-year and graduate courses are particularly suitable, first-year and second-year courses may be taken in appropriate cases. Members of the bar taking graduate work in this way register as unclassified students or as Continuing Legal Education students.

Programs for Foreign Lawyers

To meet the needs of lawyers from countries whose legal systems are not based on the English law, the Law School provides two additional programs of study. For those who wish to acquire an understanding of our system which will permit them to work with its materials and practitioners after returning to their own countries, the program for the degree of Master of Comparative Law permits a selection of regular courses taken with undergraduate and graduate students. Foreign lawyers who wish to practice in a common law jurisdiction may enroll in the program for the degree of Master of Comparative Law (American Practice), a more intensive program of courses appropriate to this goal.

Research in Public Law

Research in public law is conducted under the supervision of members of the Faculty of the Graduate School of Public Law. The purpose of this research is to furnish means for training specialists in public law, either as government lawyers or as lawyers representing individuals or corporations in cases in which the Government is a party; and to assist in the analysis, clarification, formulation, and improvement of public law, substantive and procedural.

Candidates for graduate degrees and specially qualified seniors may pursue this work.

Unclassified Students

A member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this School.

Continuing Legal Education Students

A simplified admission and registration procedure is used for members of the bar who desire to take courses on a noncredit basis. Continuing Legal Education students may not participate in student activities or benefit from the medical privileges of the University.

REQUIREMENTS FOR THE DEGREES

Master of Laws

To be recommended for the degree of Master of Laws (LL.M.) the student must have completed a residence period of not less than two semesters. Such residence should normally be continuous. All requirements for the degree must be completed in this School and in a period not exceeding two years after registration for work for the degree. The student must have completed, with a minimum average of 75, 20 semester hours in courses listed in the law curriculum as graduate courses except that in appropriate cases second- and third-year courses may be approved for inclusion in the program of study if not previously taken.

Master of Comparative Law

The degree of Master of Comparative Law (M.Comp.L.) is for foreign students who intend to return to their countries. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed satisfactorily 24 semester hours in approved courses in the curriculum of the School or of such other departments of the University as the Faculty of the School shall approve.

Master of Comparative Law (American Practice)

The degree of Master of Comparative Law, American Practice (M.Comp.L.(Am. Prac.)) is for foreign students who intend to remain in this country. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed 28 semester hours in approved courses in the curriculum of the School with a cumulative average of at least 65.

Doctor of Juridical Science

To be recommended for the degree of Doctor of Juridical Science (S.J.D.) the student must have completed a residence period of not less than one academic year. He must have pursued a course of study and research designated by his consultative committee and approved by the Faculty of the Graduate School of Public Law. At the conclusion of his first year of residence, or at such other time as the Faculty may set, the candidate must pass an oral examination in those fields of study selected by the consultative committee. This examination is conducted by the consultative committee and such other members of the Faculty and qualified experts as are selected by the Faculty.

No later than the date specified in the University calendar the candidate must submit to the Dean of the Graduate School of Public Law three complete copies of the dissertation together with a fourth copy of the summary. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the

regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. To be acceptable the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information will be supplied by the Dean.

The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

THE SCHOOL OF ENGINEERING

THE FACULTY AND STAFF OF INSTRUCTION*

M. A. Mason, *Dean;* C. H. Walther, *Assistant Dean;* H. E. Smith, *Director, Engineering Administration Program*

Professors P. A. Crafton, Louis dePian, N. T. Grisamore, R. A. Hechtman, Ben Lindberg, T. P. G. Liverman, M. A. Mason, Florence Mears, R. H. Moore, C. R. Naeser, Lewis Slack†, H. E. Smith, C. H. Walther

Adjunct Professors Churchill Eisenhart, L. A. Guildner, A. G. McNish, Gunther Sorger, Theodore Young

Professorial Lecturers Ezra Glaser, F. P. Hall, F. K. Harris, Laurence Heilprin, H. L. Stier

Associate Professors G. M. Arkilic, R. R. Fox, H. H. Hobbs, John Kaye, A. C. Murdaugh, M. S. Ojalvo, D. G. White

Associate Professorial Lecturers M. J. Rosenbaum, K. W. Webb

Assistant Professors E. H. Braun, R. E. Cronin, R. L. Dedrick, John Eftis, C. D. Ferris

Lecturers George Abraham, W. W. Balwanz, J. A. Cunningham, Howard Eisner, Milton Gussow, Gershon Kulin, P. S. Morgan, Jr., D. C. Rohlfs, L. S. Rotolo, P. H. Sawitz

Instructors D. K. Anand, T. P. Carroll, Ronald Feit, A. C. Meltzer, R. M. Moore, J. D. O'Neale

Associate T. B. Wiggins

COMMITTEES‡

THE DEAN'S COUNCIL§

1963: P. A. Crafton, N. T. Grisamore; 1964: R. R. Fox, C. R. Naeser;
1965: Louis dePian, M. S. Ojalvo

COMMITTEE ON ADMISSION AND ADVANCED STANDING

M. S. Ojalvo *(Chairman)*, G. M. Arkilic, A. C. Meltzer

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* The Staff of Instruction listed here is for the academic year 1961–62.

† On leave of absence spring semester 1961–62.

‡ The Dean of the School and the Assistant Dean in the School are members ex officio of all committees. Membership of committees listed here is for the academic year 1961–62.

§ The President of the University, the dean of Faculties, the Dean of the School and the Assistant Dean in the School, the Registrar of the University, the Director of Admissions of the University, the Professors, Adjunct Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

‖ Elected by the Faculty.

Committee on Scholarship

R. R. Fox *(Chairman)*, E. H. Braun, R. L. Dedrick

Committee on Graduate Studies*

M. A. Mason *(Chairman)*, G. M. Arkilic, P. A. Crafton, Louis dePian, H. E. Smith

Committee on Research

N. T. Grisamore *(Chairman)*, R. L. Dedrick, C. D. Ferris

GENERAL INFORMATION

INTRODUCTORY

The School of Engineering was organized October 1, 1884 as the Corcoran Scientific School of Columbian University and was situated in the University Building then at 15th and H Streets, NW. The school was named in honor of William W. Corcoran, Trustee and President of the Corporation from 1869 to 1888. Day and evening courses were offered in Literature, Science, and Technology and led to the degrees of Bachelor of Science, Civil Engineer, Mechanical Engineer, and Mining Engineer. The school was among the first to accept women for degree candidacy in engineering.

In 1903 the Corcoran Scientific School, the School of Graduate Studies, and the Columbian College were merged into a single Department of Arts and Sciences. Engineering degrees were made graduate.

Administrative changes led to The Washington College of Engineering being initiated in 1905 as one of the several semi-independent undergraduate colleges of the University, each with its own Board of Trustees. The College provided instruction leading to undergraduate degrees in engineering and architecture.

In 1909 the name of the College was changed to the College of Engineering and Mechanic Arts, and the curricula were revised to give the student a thorough understanding of the theory underlying engineering practice. Emphasis was placed on the development of a knowledge of scientific principles upon which the student could build and by which he might solve new problems as they are met in practice.

The name of the school was changed again in 1914 to the College of Engineering and later to the School of Engineering. Architecture was dropped from the curriculum and degrees were limited to the field of engineering. However, the primary emphasis upon principles rather than technology which had characterized the School since 1903 was continued and has remained to this day as one of the important distinguishing features of the School.

The location of the School of Engineering in the nation's capital makes available a group of outstanding engineers and scientists as lecturers. It is traditional for the School to include these eminent professional specialists among the staff of instruction.

Since 1884 courses of instruction have been open to both men and women.

Those curricula of the School of Engineering which are within the purview of the Engineers' Council for Professional Development are accredited by that agency.

Objective

The objective of the School of Engineering is to produce graduates who possess knowledge and understanding of the fundamental scientific principles in their fields

* Appointed by the Dean upon recommendation of the Faculty.

of study; some skill in their application; and an attitude of responsibility toward society and the engineering profession.

ORIENTATION PROGRAM*

Students in the School of Engineering participate in the Orientation Program of the University, which is held during the week preceding registration for the fall semester. Events of the program include an advising period when members of the Faculty in the School of Engineering are available for personal interviews to assist students in planning their programs to best prepare them for ultimate goals; an Orientation Assembly, required of all new students; a Curriculum Assembly, for guidance in the selection of courses for the coming semester; placement tests for new students who do not have advanced standing in mathematics and English; qualifying examinations for students who wish to waive curriculum requirements or qualify for advanced standing; scheduled social events; and the opportunity to discuss with older students and with staff members concerned with student activities the extracurricular program of the University, so that a wise and rewarding selection may be made.

The placement tests are required and are scheduled during Orientation week for students entering the School of Engineering, and again during the week prior to the spring registration for students entering at that time. The results are available to students and advisers before registration as a guide to class placement. Students shown by such tests to be inadequately prepared are required to take remedial work before undertaking Engineering courses in areas of deficiency.

Programs of Study

Programs of undergraduate study are offered leading to the Engineering Technologist Certificate and the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering (with optional areas of concentration).

Graduate work is offered under the supervision of the Committee on Graduate Studies, leading to the degrees of Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

ADVISORY SYSTEM

The School of Engineering encourages a close Faculty-student relationship. Every entering undergraduate student is assigned a permanent Faculty adviser to assist him to orient himself in the engineering discipline. Faculty advisers counsel students on their programs of study, the achievement and maintenance of satisfactory scholastic performance, professional development, and extracurricular activity as part of the educational process. The adviser represents the student in all cases requiring Faculty action.

Students who have not satisfactorily completed 70 semester hours must obtain their advisers' approval of programs of study prior to registration.

Until a student has completed the work of the freshman and sophomore years he must follow the recommendations of his adviser in all academic matters. However, an adviser may not deny a student entry into any course or activity to which he is entitled under the regulations of the School. Students having junior or senior status are encouraged to consult their advisers. The Dean acts as temporary ad-

* See the calendar for dates of scheduled events.

viser to entering or transfer students pending assignment of their permanent advisers.

All students are encouraged to discuss college problems with their advisers or instructors at any time; and parents or guardians are invited to consult with the Dean and advisers, concerning any student problems.

Faculty advisers discharge their counseling duties in accordance with the high principles of their professional responsibility; however, the final responsibility for a student's action lies wholly with the student.

REGULATIONS

Regulations concerning Admission, Registration, Fees and Finances *are stated on pages 8–23; other University regulatons, on pages 39–45.*

AMOUNT OF WORK

A full-time undergraduate student who is not on probation may take no more than 20 semester hours. A student employed more than 24 hours a week who is not on probation may take no more than 10 semester hours.

A student previously unemployed who accepts employment after registration must immediately report that fact to the Dean so that his schedule may be adjusted if necessary.

ATTENDANCE

A student cannot attend classes until registration is completed and fees due are paid. A student may be dropped from any course for undue absence.

A student suspended for any reason may not attend classes during the period of suspension.

The student is expected to attend every meeting of the course in which he is registered, fully prepared to carry on the work required. The student is held responsible for all work in the course, and all absences must be excused before provision will be made for him to make up the work missed. Excuses for absences from examinations which have been announced in advance can be obtained only by making written application to the instructor in charge of the course.

Changes in Program of Studies

In addition to the general University regulations on pages 39–45, the following regulations apply to students in the School of Engineering:

After the registration period a student may not make any changes in his registration without the approval of the Dean. Requests for changes in registration must be made on forms provided in the Office of the School of Engineering.

During the seven days following the first day of classes of a semester, additional courses may be added to the student's program with the approval of the instructor, the student's adviser, and the Dean.

Withdrawal from any course without academic penalty after the fourteenth day following the first day of classes of a semester may be granted by the Dean under the following conditions: (1) exceptional circumstances make the request necessary; (2) the request is submitted on the official form for late withdrawals; (3) as of the date of request, the grades in all courses involved are *C* or better; and (4) approval of the Committee on Scholarship is obtained by the student.

In the exceptional circumstances mentioned above the Dean, upon recommenda-

tion of the Committee on Scholarship, may authorize withdrawal without academic penalty. In all cases financial regulations governing withdrawals remain in full effect.

CREDIT

Credit toward a degree is given only after registration for and satisfactory completion of the required work of classes or upon the granting of advanced standing in accordance with the regulations of the School. A student who takes a course as an auditor may not take the same course later for credit.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

HONORS LIST

The Faculty of the School of Engineering recognizes meritorious scholastic achievement by an Honors List, containing in alphabetical order the names of candidates for undergraduate degrees in engineering, whose scholastic achievement satisfies all of the following requirements:

1. The candidate's cumulative quality-point index is equal to or exceeds 3.00.
2. At least 30 semester hours of credit have been earned while a degree candidate in the School of Engineering.
3. At least 15 (part-time student) or 30 (full-time student) semester hours of credit in an engineering degree curriculum have been earned in the two semesters immediately preceding the award.
4. No grade below *C* has been received during the qualifying period stated above.
5. No disciplinary action has been taken in respect to the student.

The Honors List is prepared at the end of the fall and spring semesters and displayed in an appropriate public place in the School of Engineering. A notation is made on the student's record each time his name is included in an Honors List.

ENGINEERING TECHNOLOGIST CERTIFICATE

A two-year program of studies, leading to the Engineering Technologist Certificate, prepares the student to assume minor responsibilities in the field of measurement science. It is open to high school graduates who meet the requirements for admission stated on pages 14 and 15.

THE BACHELOR'S DEGREES

The Bachelor's degrees are Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering.

The degree of Bachelor of Science in Engineering may be earned with any of the following options: Chemistry, Engineering Administration, Machine Computer, Mathematics, Measurement Science, or Physics.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, and Bachelor of Mechanical Engineering are accredited by the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

REQUIREMENTS FOR THE CERTIFICATE AND THE DEGREES

Scholarship*

Undergraduate

In order to graduate, a student must have a quality-point index of at least 2.00 in all work taken at this University and accepted in the School of Engineering.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors report to the Dean the names of students whose scholarship is unsatisfactory. On receipt of a warning notice the student must consult his instructor and his adviser immediately.

The adviser may prescribe diagnostic tests and/or remedial study to be completed before the end of the current semester.

Probation.—A student whose quality-point index falls below 2.00 is placed on probation. This probation extends over the period in which the student attempts 12 semester hours of study.

A student on probation may be required to follow a program of study, including remedial studies, prescribed by the Committee on Scholarship. He may not hold office, participate in the activities of any student organization, or represent the School in any student activity.

Suspension.—A student whose quality-point index is below 2.00 at the end of his probationary period is suspended. A student whose index falls below 2.00 after removal from probation is suspended.

At the time of his suspension a student may apply to the Committee on Scholarship for guidance concerning remedial action he should take during the period of his suspension.

A student suspended for poor scholarship may apply† to be readmitted in the semester or summer session which begins next after an interval of one calendar year. To be considered for readmission he must pass prescribed tests. A student readmitted after suspension is on probation. He must maintain a current quality-point index of at least 2.50 on each 12 semester hours of work undertaken until his cumulative index is 2.00. In no case will the probationary period after readmission exceed 24 hours of study. A student suspended twice for poor scholarship will not be readmitted.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean's Council. The Council may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean's Council.

Residence

For the Engineering Technologist Certificate, a minimum of 30 weeks and the last 36 semester hours must be completed in residence.

For the Bachelor's degrees, a minimum of 30 weeks and 36 semester hours must be completed in residence. Summer work may be counted. Unless special permission

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* For graduate scholarship requirements, see page 105.

† Application for readmission should be made two months in advance to permit the taking and grading of readmission tests.

is granted by the Dean to study elsewhere, the work of the senior or final year must be completed in residence.

CURRICULUM REQUIREMENTS

The satisfactory completion of one of the following curricula is required of all students registered for a Bachelor's degree in Engineering except those in the field of Measurement Science. For curricula leading to the Engineering Technologist Certificate and the degree of Bachelor of Science in Engineering with option in Measurement Science, see pages 111 and 111–12.

Variations from the prescribed curricula may be made, with the permission of the Dean's Council. A student desiring to omit a required course and substitute another must make written application to the Dean presenting satisfactory reasons for the substitution; written approval must be obtained before registration for the course.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status, see page 42.

BACHELOR OF CIVIL ENGINEERING

	Freshman Year*	Semester Hours
†Eng. 1 or 1X, 2	English Composition	6
‡Math. 21, 22, 23, 24 or Math. 27, 28	Calculus I, II, III, IV	12
ME 9	Introduction to Engineering	3
ME 10	Graphical Communication	2
Phys. 11	Introductory Physics	3
Phys. 14	General Physics	3
	Total	29

ROTC.—Air Force ROTC students take Air Science 1–2 and 22 (4).

	Sophomore Year	Semester Hours
Chem. 13–14	General Chemistry	8
CE 21	Rigid Body Mechanics I	3
CE 24	Mechanics of Deformable Bodies I	3
EE 11–12	Fundamentals of Electrical Engineering	6
Math. 111, 112	Mathematics for Engineers and Physicists I, II	6
Phys. 15, 16	General Physics	6
Elective	In humanities or social studies (see page 104)	3
	Total	35

ROTC.—Air Force ROTC students substitute Air Science 11–12 and 51 (4) for Elective (3).

BACHELOR OF CIVIL ENGINEERING

	Junior Year	Semester Hours
CE 112	Surveying	3
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3

* Exceptional students may qualify for admission to advanced courses by successfully completing qualifying examinations. Credit is not given for English A, B; Mathematics 3, 6; or Speech B.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared for English 1 are assigned to English 1X.

‡ Students who started to meet the freshman-year mathematics requirement with the sequence of Mathematics 12, 29, 30, 31 should continue in that sequence. They should note, however, the terminal semesters for the offering of these courses.

CE 143–44	Structural Theory I–II	8
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
Elective	In humanities or social studies (see page 104)	10
	Total	37

SENIOR YEAR

		Semester Hours
CE 128	Soil Mechanics	3
CE 135	Hydraulic Engineering	3
CE 137	Applied Earth Sciences	3
CE 145	Metal Structures	3
CE 146	Reinforced Concrete	3
CE 154	Structural Dynamics	3
CE 157	Mechanics of Deformable Bodies II	3
CE 165	Engineering Analysis and Planning	3
CE 168	Regional and Urban Planning	3
Elective	In humanities or social studies (see page 104)	6
*Elective	Technical Electives	6
	Total	39

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF ELECTRICAL ENGINEERING

JUNIOR YEAR

		Semester Hours
CE 121	Rigid Body Mechanics II	3
EE 102	Engineering Electronics I	3
EE 103	Electric and Magnetic Fields	3
EE 104	Field Analysis	3
EE 107	Steady-state Network Analysis	3
EE 111	Electrical Measurements	3
EE 113	Electrical Engineering Laboratory I	2
EE 122	Electrical Engineering Laboratory II	2
EE 127	General Network Analysis	3
EE 134	Engineering Electronics II	3
Phys. 116	Quantum and Solid State Physics	3
Elective	In humanities or social studies (see page 104)	6
	Total	37

SENIOR YEAR

		Semester Hours
CE 132	Fluid Mechanics	3
EE 118	Electrical Energy Conversion	3
EE 123–24	Electrical Engineering Laboratory III–IV	4
EE 136	Electromagnetic Waves	3
EE 137	Active Network Theory	3
EE 171	Digital Circuitry and Systems	3
ME 113	Thermodynamics I	3
Elective	In humanities or social studies (see page 104)	8
†Elective	Technical Electives	9
	Total	39

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

* B.C.E. candidates elect any courses numbered from 100 to 300 in the sciences or engineering offered at this University.

† B.E.E. candidates elect from EE 133, 142, 172, or ES 154.

BACHELOR OF MECHANICAL ENGINEERING

Junior Year

		Semester Hours
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics I	3
ME 100	Analytical Kinematics	3
ME 113, 114	Thermodynamics I, II	6
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics	3
Phys. 191	Nuclear Reactors	3
Elective	In humanities or social studies (see page 104)	5
	Total	39

Senior Year

		Semester Hours
CE 157	Mechanics of Deformable Bodies II	3
ME 123, 124	Advanced Dynamics I, II	6
ME 135–36	Thermal Power	6
ME 139	Fluid Machinery	3
ME 143	Production Analysis	3
ME 146	Dynamics of Compressible Fluids	3
ES 154	Automatic Control	3
Elective	In humanities or social studies (see page 104)	4
	Total	9
		37

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF SCIENCE IN ENGINEERING

Junior and Senior Years (Except for Measurement Science)

		Semester Hours
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics I	3
EE 103	Electric and Magnetic Fields	3
ME 100	Analytical Kinematics	3
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics	3
	Total of Required courses	31
Option	As approved by the Department of Option and by the Dean	30
Elective	In humanities or social studies (see page 104)	15
	Total	76

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective (3) and option course (3).

The Bachelor of Science in Engineering curriculum provides training in the basic physical principles employed in engineering and in engineering methods of analysis, and in addition, offers an opportunity for study in an optional field in which the student has special interest.

Optional studies can be selected from one or (occasionally) more of the fields of Chemistry, Engineering Administration, Machine Computer, Mathematics, Measurement Science,* or Physics. The program of study in the option is formulated by the department concerned in conference with the student. The program, bearing the approval of the Chairman of the department concerned, must be submitted by the student to the Dean before the beginning of the junior year.

Elective in Humanities and Social Studies

Required elective courses in the humanities and social studies may be selected from the offerings of the following departments of instruction: Art, Classical Languages and Literatures, Economics, English, Geography, Germanic Languages and Literatures, History, Philosophy, Political Science, Religion, Romance Languages and Literatures, Slavic Languages and Literatures, Sociology and Anthropology.

Graduate Record Examinations

During the final semester of the senior year students in the School of Engineering are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and the Advanced Test (Engineering) designed to measure the achievement of the college senior in his major field of study. (For further information concerning the Graduate Record Examinations, see page 43.)

THE MASTER'S DEGREES

Upon satisfactory completion of appropriate graduate requirements, the degree of Master of Science in Engineering or Master of Engineering Administration is conferred.

Study for the Master's degree is based upon a faculty-student relationship in which the ability and needs of the individual student are important elements in determining the curriculum. Programs are not restricted to one department or to a single field or type of study. They may include special instruction by assigned members of the engineering faculty or approved courses offered in other colleges and schools of the University. The Committee on Graduate Studies is responsible for establishing each student's program and for providing for its direction.

Admission to Graduate Study

For admission to graduate study the student must have a Bachelor's degree from a recognized institution and he must satisfy the Committee on Graduate Studies of his capacity for productive work in the field selected.

Applicants who have significant deficiencies in their preparation may qualify for admission to graduate study by taking prescribed undergraduate courses.

In some cases such study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

Admission to Degree Candidacy

Admission to graduate study does not constitute admission to degree candidacy. Specific requirements for admission to degree candidacy are stated under the headings of the appropriate degrees.

* The curriculum in Measurement Science is stated on pages 111-12.

Advanced Standing

Graduate courses completed before admission are not transferable for degree credit. The Committee on Graduate Studies may, however, consider them in planning individual programs. Course work to satisfy requirements for another degree granted by the University may not be used again to satisfy requirements for a Master's degree in the School of Engineering.

Requirements for the Degrees

Residence

The candidate for a Master's degree must complete a minimum of one year of full-time study, or the equivalent in part-time study, under the direction of the Committee on Graduate Studies. A full-time student must complete all requirements for the degree within three years; a part-time student, within five years.

Scholarship

A minimum grade of "Satisfactory" is required in all courses. A student who makes one grade of "Unsatisfactory" may repeat the course once, or he may appeal to the Committee on Graduate Studies for guidance. A student who receives two or more grades of "Unsatisfactory" will not be permitted to enroll further in the School of Engineering until he demonstrates by examination, or as the Committee may direct, that his deficiencies in course work have been removed. A grade of *B* or better is required for undergraduate courses taken to remove deficiencies in preparation for graduate study.

Master's Thesis

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, and to furnish objective evidence of constructive power in a given field. Work of a suitable character for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

Comprehensive Examination

To demonstrate substantial understanding of principles and methods of their use in the area of his interest, the student must pass a comprehensive examination, written, oral, or both, as prescribed by the Committee on Graduate Studies. This examination will not be taken until the candidate has successfully completed the prescribed program of study and submitted an acceptable Master's thesis.

THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING

The objective of this discipline is a substantial comprehension of scientific principles and methods for their use, as applied in modern engineering. Increased understanding of engineering science and its use in solving engineering problems are sought, rather than a breadth of familiarity with applications and techniques.

A program of study consisting of at least 24 semester hours of graduate courses to prepare the candidate for his comprehensive examination and a written Master's thesis (6 semester hours) is formulated, with particular attention to the individual student's needs and objectives. The program may provide for broad coverage in a

variety of fields or may be designed to give some degree of specialization in a particular area, as determined by conference with the Committee at the time of admission to candidacy.

The level of the courses ordinarily requires as prerequisite the satisfactory completion of at least one undergraduate course in mathematics beyond the first course in ordinary differential equations and at least one in the area of the graduate course to be undertaken.

Admission to Degree Candidacy

Application for admission to degree candidacy must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must: (1) have completed satisfactorily all prescribed prerequisite study, (2) have satisfactorily completed a graduate course in each of two different subjects designated as Engineering Science, and (3) give evidence of satisfactory personal and intellectual qualifications.

Required Courses

After admission to graduate study, the student must take two Engineering Science courses before applying for admission to degree candidacy. Additional courses must be chosen from the areas of fundamental engineering study listed below.

Automatic Control	Fluid Dynamics
Elasticity	Structural Theory
Electric Networks	Thermodynamics
Electromagnetic Fields	Transients

Graduate courses in the basic areas of mathematics, physics, or chemistry may be substituted for these additional courses with the approval of the Committee.

Program of Study

The remainder of the program is formulated by the student and his adviser, following the student's admission to degree candidacy. Major emphasis is usually given to study in fundamental and applied areas of engineering, mathematics, or science. The program may, however, include study in any areas which are characterized by a scientific discipline.

THE DEGREE OF MASTER OF ENGINEERING ADMINISTRATION

The objective of this discipline is to develop an understanding of the principles and a competence in the practices of administration as applied to engineering and scientific activities. Knowledge and understanding are sought rather than mere familiarity with techniques.

A study program is prescribed for each candidate, in accordance with his preparation and objective, by the Committee on Graduate Studies or an assigned adviser. Programs are integrated sequences of courses.

The degree of Master of Engineering Administration is granted upon the successful completion of (1) 30 semester hours of graduate courses, including the written Master's thesis, and (2) the Comprehensive Examination.

Prerequisite to Admission to Graduate Study

In addition to the requirements for admission to graduate study stated on page 104, the applicant must have an adequate knowledge of the principles of human

relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by the successful completion of the following undergraduate courses or an approved equivalent: Psychology 145 *Principles of Human Relations*, Accounting 115 *Survey of Accounting*, and Statistics 107 *Statistics for Engineers*.

Admission to Degree Candidacy

Application for admission to degree candidacy must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must: (1) have completed satisfactorily all prescribed prerequisite study; (2) have satisfactorily completed courses EA 201 *Engineering Administration I*, EA 202 *Engineering Administration II*, and EA 271 *Operations Research;* and (3) give evidence of satisfactory personal and intellectual qualifications.

Program of Study

The content of the courses immediately following is considered essential knowledge for every candidate for the degree of Master of Engineering Administration. The candidate is required to complete all of the courses except those in which he (1) has successfully completed graduate study or (2) can demonstrate to the Committee on Graduate Studies an acceptable knowledge of the course field.

		Semester Hours
EA 201	Engineering Administration I	3
EA 202	Engineering Administration II	3
EA 271	Operations Research	3
EA 299–300	Thesis	6

The remainder of the program is formulated by the student and his adviser, following the student's admission to degree candidacy. This program usually consists of Engineering Administration courses, but may include courses in related departments of instruction.

Students who choose to concentrate in the quantitative area of study will normally select courses from the following group:

		Semester Hours
EA 261	Economic Analysis of Engineering Planning	3
EA 263	Quantitative Techniques of Engineering Administration	3
EA 272	Problems in Operations Research	3
EA 275	Linear Programming	3
EA 276	Theory of Games	3
EA 277	Queuing Theory	3

This basic program may be supplemented by appropriate electives in other departments of instruction with the approval of the adviser.

THE DOCTORAL PROGRAM

Introductory

The School of Engineering offers a program of advanced study and research leading to the degree of Doctor of Science. This program is limited to recognized engineering fields in which a scientific discipline exists and for which the University has adequate resources.

The Doctoral discipline is designed to prepare the student for a career of creative scholarship by providing a broad background of knowledge and an under-

standing of research methods. It requires study of interrelated fields of learning as well as original research in the engineering field of central interest.

The discipline for the degree is divided into two stages. The first—made up of a study of interrelated fields of learning which support the general area of research concentration—culminates in the qualifying examination. The second—composed of research investigation of a particular subject in a special field and the presentation of such research findings in a written dissertation—culminates in the final examination.

Detailed information on the program is provided in a separate publication obtainable on request.

Admission

The applicant must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

Language Requirements

A reading knowledge is required of two foreign languages important in the student's field of interest. One language examination must be passed before admission to graduate study. The second must be passed before admission to the qualifying examination and within one year of the start of study for the qualifying examination.

Application for Admission

Well in advance of the opening of the semester for which the student seeks admission, he must have a personal interview with the Chairman of the Committee on Graduate Studies or the professor under whom he wishes to study, to discuss the field of study, the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities of an effective doctoral program. If an application for admission is indicated, the student will be advised concerning the details of application procedure.

Study for the Qualifying Examination

Upon admission to study for the qualifying examination the student's admission committee becomes his Consultative Committee, which prescribes and directs his studies. The Committee assigns to him a group of fields of learning deemed necessary to insure his breadth of knowledge, as well as to support research in his central field. Members of the Committee advise the student concerning the scope and content of these fields of study, which are generally more inclusive and intensive than courses of instruction announced in the University catalogue, and will guide him in preparation for his examination in them.

The purpose of the qualifying examination is to ascertain that the student's breadth of background and intellectual development are adequate to support doctoral research and investigation in his central field. The qualifying examination is both written and oral and usually extends over a period of six days. It is given by a special committee consisting of members of the student's Consultative Committee and other scholars. Upon favorable report of the examiners to the Com-

mittee on Graduate Studies the student is admitted to candidacy for the degree, to pursue his specialized study and research under the supervision of a designated member of the Faculty.

The examination is the sole test of the student's ability to qualify for admission as a candidate for the degree, and to enter the second stage of his doctoral discipline.

Research, the Dissertation, and the Final Examination

The student admitted to candidacy for the degree requests as Master in Research the member of the Faculty under whom he wishes to pursue research and specialized study. The Faculty member may accept or reject such request. The research is arranged by the Master and approved by the Committee on Graduate Studies. Throughout the remainder of the doctoral program, the candidate is responsible solely to his Master in his research and in the presentation of his dissertation.

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results. Upon approval of the dissertation (see page 43) by the Master, the candidate is presented for his final examination. The summaries of accepted dissertations are printed in a numbered issue of the University Bulletin. The successful candidate is required before receiving his degree to pay a fee to cover the expense of the printing of the summary of his dissertation.

The final examination is oral and is open to the public. The candidate must demonstrate a mastery of his special field of interest and of the materials and techniques used in the research. The committee of examiners includes members of the Committee on Graduate Studies competent in the research field or in closely related subjects and may also include qualified experts brought to the University especially to participate in the examination. If the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Committee on Graduate Studies recommends him for the degree of Doctor of Science.

Residence and Continuous Study

All of the work for the degree must be done in residence (on the campus), except in certain circumstances when the student may be permitted to undertake a portion of the research problem in an approved off-campus facility. The student must maintain continuous registration in the School of Engineering, even when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student, and he must apply for readmission to graduate study under whatever new conditions and regulations are set up by his consultative committee.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the qualifying examination or as a candidate engaged in doctoral research. The qualifying examination, however, must be completed within five years of the date of admission, and the entire degree program must be completed within seven years. After admission the student may apply for his qualifying examination whenever his consultative committee believes that he is prepared to take it; his research and specialized study may be undertaken with whatever concentration of time meets the approval of his research adviser. Normally a minimum of two years of full-time study and research is spent in meeting the requirement for the degree.

THE CENTER FOR MEASUREMENT SCIENCE

The Center, under the direction of the School of Engineering, is a cooperative activity of the University, industry, and government providing education, research, and service programs related to measurement. It was established by the University in 1960, with the collaboration of the National Bureau of Standards and the financial support of a grant from The Martin Company of Baltimore, Maryland.

The principal, but not exclusive, activities of the Center are:

The education of persons for careers in measurement science;

The development and improvement of measurement, standardization, and calibration techniques, apparatus, and data—with particular reference to high precision.

The provision of staff and facilities available to industry for research and consultation on measurement problems in industry, and including the maintenance of primary standards of measurement directly traceable to the national standards.

The publication of results of research, manuals of practice and procedures, and information related to measurement science.

The Center maintains relations with industry and government through its Associate Program, in which interested individuals, companies, or other organizations may participate. The mutual communication, collaboration, and support made possible by this program bring vitality to the Center activities and insure attention to the needs of industry and government.

Through these and other activities the Center serves as a source of personnel competent in measurement science, as an instrument for collaborative research on measurement problems, and as a service organization providing expert capability to industrial and government organizations in the solution of their measurement problems.

The Education Program

The Education Program of the Center consists in part of four curricula offered by the School of Engineering, which prepare the student to assume responsibilities in the field of measurement science. The curricula are integrated, to permit a student to terminate his formal education at any level, or to proceed to the next level. Programs lead to the Engineering Technologist Certificate and the degrees of Bachelor of Science in Engineering, Master of Science in Engineering, and Doctor of Science.

In addition to the certificate and degree programs, the education program includes seminars, special conferences, and short courses offered from time to time.

The Research Program

The research program of the Center includes all aspects of research and development related to measurement science. Research and/or development may be undertaken as independent studies by staff members for the Center, as studies for a sponsor under contract, or by personnel of Associates of the Center assigned to the Center to undertake the specific work. Associates receive publications of the Center; certain publications may be restricted in distribution.

The Service Program

The Service Program of the Center provides a mechanism for obtaining consultation and assistance of the faculty, staff, and facilities of the Center in connection

with specific problems in measurement. The program is restricted to the use of the Associates of the Center.

Additionally the Service Program makes it possible for Associates to engage the various resources of the University, through the Center, as may be desirable and feasible, in solution of their problems in measurement.

For complete information concerning the Center for Measurement Science, see the bulletin, which is available upon request to the Director of the Center for Measurement Science, Tompkins Hall, 725 Twenty-third Street, NW., Washington 7, D. C., FEderal 8-0250, Extension 246.

ENGINEERING TECHNOLOGIST CERTIFICATE

This is a two-year program open to high school graduates who meet the requirements for admission stated on pages 14 and 15.

Regulations governing students enrolled in the Engineering Technologist program are stated on pages 98–101.

CURRICULUM

First Year

		Semester Hours
Chem. 13–14	General Chemistry	8
Engl. 1 or 1X	English Composition	3
*Math. 21, 22, 23, 24 or Math. 27, 28	Calculus I, II, III, IV	12
Physics 11	Introductory Physics	3
Physics 14	General Physics	3
ME 9	Introduction to Engineering	3
ME 10	Graphical Communication	2
	Total	34

Second Year

CE 21	Rigid Body Mechanics I	3
CE 24	Mechanics of Deformable Bodies I	3
CE 121	Rigid Body Mechanics II	3
EE 11–12	Fundamentals of Electrical Engineering	6
Math. 111	Mathematics for Engineers and Physicists I	3
Metr. 5	Foundations of Metrology I	5
†Metr. 6	Foundations of Metrology II	4
Metr. 4	Introduction to Statistics for Metrology	3
Physics 15, 16	General Physics	6
	Total	36

BACHELOR OF SCIENCE IN ENGINEERING

Measurement Science Option

Regulations governing students enrolled in this program are stated on pages 98–101.

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* Students who started to meet the freshman-year mathematics requirement with the sequence of Mathematics 12, 29, 30, 31 should continue in that sequence. They should note, however, the terminal semesters for the offering of these courses

† Students intending to continue study toward the degree of Bachelor of Science in Engineering should substitute Mathematics 112 for Metrology 6 and English 2 for CE 121.

CURRICULUM

The curriculum for the first two years is the same as that stated on page 112, for the Engineering Technologist Certificate.

Junior Year

		Semester Hours
CE 121	Rigid Body Mechanics II	3
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics I	3
EE 103	Electric and Magnetic Fields	3
EE 104	Field Analysis	3
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
Metr. 6	Foundations of Metrology II	4
Metr. 113	Introduction to Transducers and Instrumentation	2
Elective	In humanities or social studies	9
	Total	36

Senior Year

CE 125	Engineering Materials	4
ME 100	Analytical Kinematics	3
ME 120	Physical Metallurgy	3
Metr. 111–12	Precise Electrical Measurements I, II	6
Metr. 114	Advanced Transducers and Instrumentation	3
Metr. 121	Precise Mechanical Measurements	4
Metr. 131	Precise Heat Measurements	4
Physics 116	Quantum and Solid State Physics	3
Elective	In humanities or social studies	5
	Total	35

GRADUATE DEGREES

Graduate programs in Measurement Science are offered, which lead to the degrees of Master of Science in Engineering (see pages 105–6) and Doctor of Science (see pages 107–9).

THE SCHOOL OF PHARMACY

THE FACULTY AND STAFF OF INSTRUCTION*

C. W. Bliven†, *Dean;* R. M. Leonard, *Acting Dean*

Professors C. W. Bliven†, I. B. Hansen, R. D. Kennedy, G. M. Kochl, R. M. Leonard, R. H. Moore, E. M. Renkin, R. B. Stevens, C. R. Treadwell, R. C. Vincent

Associate Professors F. D. Cooper, Rudolph Hugh, C. J. Kokoski, S. M. Schwartz, J. W. Skinner

Associate Professorial Lecturer C. G. Frailey

Assistant Professor G. G. Koustenis

* The President of the University, the Dean of Faculties, the Dean and Assistant Dean of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, and Assistant Professors constitute the Faculty.
The listing of the Faculty and Staff of Instruction is for the academic year 1961–62.
† On leave of absence 1961–62.

Special Lecturers W. S. Apple, G. F. Archambault, Karl Bambach, W. P. Briggs, C. J. Carr, E. G. Feldman, D. L. Finucane, L. E. Kazin, Henry Miller, M. L. Yakowitz

COMMITTEES*

The Dean's Council†

I. B. Hansen, C. J. Kokoski, S. M. Schwartz

Committee on Scholarship

R. C. Vincent *(Chairman)*, R. M. Leonard, G. G. Koustenis

Committee on Admission and Advanced Standing

R. M. Leonard *(Chairman)*, C. J. Kokoski, S. M. Schwartz

Advisory Committee

I. A. Tennyson *(Chairman)*, J. E. Allen, Howard Bradbury, M. H. Bortnick, W. P. Briggs, M. L. Elsberg, D. I. Estrin, F. R. Franzoni, R. D. Gibbs, M. G. Goldstein, A. J. Obert

GENERAL INFORMATION

INTRODUCTORY

In 1867 the foundation for the National College of Pharmacy was laid by the Apothecaries' Association of the District of Columbia. The College was opened in 1872 and continued until 1906, when it became affiliated with The George Washington University.

The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy.

Washington offers many opportunities for the student of pharmacy. The American Institute of Pharmacy, the headquarters of the American Pharmaceutical Association, is only a few blocks from the School of Pharmacy. The Institute also houses a pharmaceutical museum, a library, and research laboratories. Government agencies and laboratories whose activities are closely allied to pharmacy, and the government libraries, the facilities of which are open to the student, are readily accessible.

The Institute and the Federal Government bring to Washington leaders in the fields of pharmacy, many of whom present to senior students current professional information.

The objectives of the School of Pharmacy are (1) to train professionally competent pharmacists, primarily for retail practice, and to help them acquire specialized training, a general education, and an attitude of responsibility to their profession and to society; (2) to promote the health profession of pharmacy in general, and particularly within the community.

To achieve these objectives, the School has developed a systematic plan of instruction for the professional courses. In the four-year curriculum, they are integrated with the liberal arts program: in the five-year curriculum, the professional work is based on a two-year preprofessional program of basic science and liberal arts. It further encourages student participation in University, professional, and civic organizations and activities which increase professional competence, raise professional standards, and help develop social responsibility.

* The Dean and Assistant Dean of the School of Pharmacy are members ex officio of all committees.
† Elected by the Faculty.

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES *are stated on pages 8–23; other University regulations, on pages 39–45.*

Students registered in the pre-pharmacy curriculum of Columbian College of Arts and Sciences are subject to the regulations of that college.

AMOUNT OF WORK

Normal work for any year is that outlined under the head of "Curriculum Requirements", below. A student who wishes to take more than the normal amount of work may do so only with the permission of the Committee on Scholarship, the members of which are guided in their decision by his scholastic record and the extent to which he is employed. A student on probation is limited in the number of semester hours he may carry.

The student is not encouraged to undertake outside employment while attempting a full course of study. A student who maintains a general quality-point index of 2.00 or higher and an index of 2.50 in pharmacy courses may be granted permission by the Dean to undertake outside employment. The amount of employment permitted is governed by the scholarship record of the student and the number of semester hours for which he is registered.

A student who accepts employment after registration or at any time during the semester must report immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

Except by special permission of the instructor, credit will not be given for any pharmacy course if absences, including both lecture and laboratory, exceed in number for each semester the hours of credit for the semester. If a course has distinct divisions such as lectures, laboratories, or recitations, the absences apply pro rata to such divisions.

EXAMINATIONS BEFORE STATE BOARDS OF PHARMACY

To be eligible for examination before state boards of pharmacy, the applicant is required to present satisfactory evidence of graduation from a college of pharmacy. In addition, most states require one year of practical experience in a pharmacy. This experience may not be gained concurrently with the school year. In some states, a portion of it must be obtained following graduation.

THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY

The School of Pharmacy offers curricula leading to the degree of Bachelor of Science in Pharmacy.

REQUIREMENTS FOR THE DEGREE

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 39 and 40.

In order to graduate, a student must have a general quality-point index of at least 2.00. In addition, he must have an index of at least 2.50 in all pharmacy courses.

Probation.—A student must maintain a general quality-point index of 2.00 and a pharmacy index of 2.50 or be placed on probation.

The following scholarship rules on general quality-point index are applied when a

student has undertaken a multiple of 9 semester hours. Those on the pharmacy index are applied when he has completed 12 pharmacy hours and thereafter are applied in multiples of 9 hours.

First Probation.—A student is placed on first probation when his general quality-point index is below 2.00 or his pharmacy index is below 2.50. (See also under "Suspension".)

Second Probation.—A student who has a general quality-point index below 2.00 or a pharmacy index below 2.50 after a multiple of 9 semester hours is placed on second probation. However, a student who has a general index between 1.50 and 2.00 or a pharmacy index between 2.20 and 2.50 is considered by the Committee on Scholarship. In each case, the Committee may retain him on probation or suspend him.

Suspension.—A student who has a general quality-point index below 1.50 or a pharmacy index below 2.20 is suspended. However, a student who has a general index between 1.40 and 1.50 or a pharmacy index between 2.00 and 2.20 is considered by the Committee on Scholarship. In each case, the Committee may retain him on probation or suspend him.

A student subject to probation for the third time, whether successive or after an interval, is suspended. In considering a student for suspension, the rules on probation apply to the general and to the pharmacy index independently.

A student suspended for poor scholarship may apply for readmission after an interval of a calendar year. He must then submit evidence to the Dean that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

Curriculum

The curriculum, including the two-year pre-pharmacy curriculum (see page 54) requires five years. The last year of the four-year curriculum is available only to those students who were admitted to this program by or before September 1960, and who intend to receive the degree by June 1963.

Both the four- and five-year curricula are given below.

Four-year Curriculum.—The curriculum requirements include at least 141 semester hours. The following curriculum leads to the degree of Bachelor of Science in Pharmacy (the junior-year curriculum terminated in June 1962; the senior-year curriculum will be offered for the last time in 1962–63).

Senior Year: Fall Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Biochemistry 221	32	96	4	128
Pharmacy 103	32	96	4	128
Pharmacy 111	48	.....	3	48
Pharmacy 165	48	.....	3	48
Elective	48	.....	3	48
Total	208	192	17	400

Senior Year: Spring Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Biochemsitry 222	32	96	4	128
Microbiology 210	32	.....	2	32
Pharmacy 166	32	64	3	96
Pharmacy 176	32	.....	2	32
Pharmacy 178	64	.....	4	64
Pharmacy 188	48	.....	1	48
Pharmacy 190	16	.....	1	16
Pharmacy 192	.....	48	1	48
Total	256	208	18	464
Grand Total	1,728	1,536	141	3,264

The Five-year Curriculum.—The pre-pharmacy curriculum of Columbian College of Arts and Sciences comprises the first two years of the five-year pharmacy course (see page 54). This curriculum satisfies the preprofessional needs of the School of Pharmacy and the general cultural requirements of the lower division of Columbian College.

The curriculum requirements include at least 162 semester hours. The following curriculum leads to the degree of Bachelor of Science in Pharmacy.

First and Second (Pre-Pharmacy) Years

Courses	Did. hrs.*	Lab. hrs.*	Sem. hrs.	Clock hrs.*
Courses in Columbian College of Arts and Sciences (see page 54)	784	496	64	1,280

Third Year: Fall Semester

Chemistry 21	32	96	4	128
Pharmacy 100	16	.....	1	32
Pharmacy 121	48	48	4	96
Pharmacy 125	48	.....	3	48
Physiology 137	48	64	4	112
Total	192	208	16	416

Third Year: Spring Semester

Chemistry 22	32	96	4	128
Microbiology 112	48	96	4	144
Pharmacy 122	32	96	4	128
Physiology 170	48	.....	3	48
Total	160	288	15	448

* Exclusive of Physical Education.

Fourth Year: Fall Semester

Courses	Did. hrs.	Lab. hrs.	Sem. hrs.	Clock hrs.
Biochemistry 221	32	96	4	128
Pharmacy 101	32	48	3	80
Pharmacy 110	48	.....	3	48
Pharmacy 126	32	48	3	80
Elective	48	.....	3	48
Total	192	192	16	384

Fourth Year: Spring Semester

Biochemistry 222	32	96	4	128
Microbiology 210	32	.....	2	32
Pharmacy 111	48	.....	3	48
Pharmacy 112	48	48	4	96
Pharmacy 127	48	.....	3	48
Total	208	144	16	352

Fifth Year: Fall Semester

Pharmacy 102	32	96	4	128
Pharmacy 107	48	.....	3	48
Pharmacy 109	10	6	1	16
Pharmacy 115	48	.....	3	48
Pharmacy 165	64	.....	4	64
Elective	48	.....	3	48
Total	250	102	18	352

Fifth Year: Spring Semester

Pharmacy 103	32	96	4	128
Pharmacy 166	48	64	4	112
Pharmacy 176	48	.....	3	48
Pharmacy 178	48	.....	3	48
Pharmacy 188	48	.....	1	48
Pharmacy 190	16	.....	1	16
Pharmacy 192	.....	48	1	48
Total	240	208	17	448
Grand Total	2,026	1,638	162	3,680

THE SCHOOL OF EDUCATION

THE FACULTY AND STAFF OF INSTRUCTION*

J. H. Fox, *Dean;* B. S. Root, *Assistant Dean;* A. C. LaBue, *Assistant Dean*

Professors G. L. Angel, H. F. Bright, Elizabeth Burtner, W. T. Carroll, V. J. DeAngelis, Mitchell Dreese†, D. C. Faith, J. H. Fox, R. G. Hanken, Thelma Hunt, B. H. Jarman‡, J. H. Krupa, A. C. LaBue, Helen Lawrence, C. E. Leese, G. E. McSpadden, W. H. Myers, C. W. Pettit, B. S. Root, Kathryn Towne

Professorial Lecturers K. E. Brown, D. D. Darland, J. B. Holden, Clayton Hutchins, H. O. Johnson, B. D. Joy, Florence Lumsden, Anthony Marinaccio, Madaline Remmlein, J. P. Walsh

Associate Professors J. G. Allee, Jr., Mary Coleman, H. G. Detwiler, Eva Johnson, W. A. McCauley, Carol St. Cyr, Mildred Shott, Loretta Stallings

Associate Professorial Lecturers J. L. Cameron, Beverly Crump, John Giancaspro, Samuel Kavruck, J. C. Lang, Lucille Mitchell, Eugenia Nowlin, Mary Osterndorf, R. R. Reed, Mary Scott, LuVerne Walker, H. M. Wilson, Hazel Wilson

Assistant Professors R. E. Baker, R. W. Eller, Lyndale George, Anne Ingram, Jeanne Snodgrass, Connie Vaughan

Lecturers Pat Abernethy, Marcella Bernstein, Harold Cushman, W. B. Evans, Jr., Edward Goldstein, E. M. Logan, C. O. McDaniels, Joanne Parker, W. D. Thompson, Ward Whipple

Instructor Donna Abbey

Field Studies

Director J. W. Charles; *Assistant Director* D. T. McNelis

Field Service Coordinators

Alexander Anderson, *Assistant Principal, Washington-Lee High School, Arlington, Va.;* Mary Maré, *Assistant Principal, Dean of Girls, Wakefield High School, Arlington, Va.;* C. M. Richmond, *Principal, Stratford Junior High School, Arlington, Va.*

COMMITTEES§

The Dean's Council‖

1963: W. H. Myers, Loretta Stallings; 1964: Lyndale George, Kathryn Towne; 1965: Eva Johnson, J. H. Krupa

Committee on Graduate Studies‖

J. H. Fox *(Chairman)*, G. L. Angel, H. G. Detwiler, Mitchell Dreese, D. C. Faith, Thelma Hunt, A. C. LaBue, W. A. McCauley, B. S. Root, Carol St. Cyr

Committee on Admissions and Advanced Standing¶

J. H. Fox *(Chairman)*, J. H. Krupa, B. S. Root, J. Y. Ruth, Loretta Stallings, Kathryn Towne

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* The President of the University, the Dean of Faculties, the Dean and Assistant Deans of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.
The listing of the Faculty and Staff of Instruction is for the academic year 1961–62.
† On leave of absence 1961–62.
‡ On leave of absence fall semester 1961–62.
§ The Dean and Assistant Deans of the School of Education are members ex officio of all committees.
‖ Elected by the Faculty.
¶ Appointed by the Dean.

Committee on Scholarship

B. S. Root *(Chairman)*, V. J. DeAngelis, Helen Lawrence, Kathryn Towne

GENERAL INFORMATION

INTRODUCTORY

It is the purpose of the School of Education to prepare teachers, counselors, and administrators for the higher ranges of educational service and to offer opportunities to teachers of experience to extend their education. The School includes the departments of Education, Physical Education, and Home Economics. It offers both graduate and undergraduate work. Other departments of the University provide general education and teaching field courses needed for a well-balanced program of teacher education. In addition to programs of study leading to degrees, the School offers nondegree programs for certification and the renewal of certificates.

The schedule of courses is arranged to meet the convenience of both full-time and part-time students. By attending evening, Saturday, and summer classes, teachers in the schools of the metropolitan Washington area and others within commuting range may complete all the requirements for a degree without giving up their positions.

REGULATIONS

Regulations concerning Admission, Registration, Fees and Finances *are stated on pages 8–23; other University regulations, on pages 39–45.*

Amount of Work

Fifteen to 17 semester hours of credit constitute a normal program. A student with a quality-point index of 3.00 or higher, may, with the permission of the Dean enroll for 18 or 19 hours. No student may enroll for more than 19, except by permission of the Committee on Scholarship.

A student employed 15 hours or less a week may carry a normal program of college work.

A student employed from 16 to 25 hours a week may enroll for 12 or 13 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 15 or 16 hours.

A student employed from 26 to 34 hours a week may enroll for 9 or 10 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 12 or 13 hours.

A student employed 35 hours or more a week may enroll for 6 or 7 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 9 or 10 hours.

A student who increases his hours of employment after registration or at any time during a semester must report immediately to the Dean so that his program may be adjusted, if necessary.

THE BACHELOR'S DEGREES

The School of Education offers programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics*, and Bachelor of Science in Physical Education.

The program of each student must be approved by a Faculty adviser. Since each

* This degree will be conferred for the last time in June 1963.

student's program is defined by his particular needs, it is important that the student have a clear concept of his major interest in education, and also that he be familiar with the teaching-certificate requirements of the locality in which he expects to teach.

REQUIREMENTS FOR THE DEGREES

To be recommended for a degree a student must satisfy the admission, residence, scholarship, and curriculum requirements.

RESIDENCE

Candidates for the Bachelor's degrees must complete satisfactorily while matriculated in the School of Education a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in the Off-Campus Division of the College of General Studies.

For full details concerning continuous registration, see page 42.

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 39 and 40.

In order to graduate, a student must have a quality-point index of at least 2.00.

Probation.—A student who fails to maintain a quality-point index of at least 2.00 is placed on probation. He remains on probation as long as his index is below 2.00, or until his probation is removed by the Committee on Scholarship.

Suspension.—A student on probation who fails to raise his index to 2.00 within the time specified may be suspended. A student who fails one-half or more of the minimum of 16 semester hours may be suspended.

A student suspended for poor scholarship may, within ten days, appeal his case to the Committee on Scholarship through the Dean. If the case appears to be remediable and the student seems likely to improve in his scholarship, the Committee may readmit him on probation. A student denied readmission may again, after the lapse of a calendar year, petition the Committee through the Dean for readmission. A student suspended twice will not be readmitted.

CURRICULUM REQUIREMENTS

In any of the following curricula at least 30 semester hours must consist of courses numbered above 100.

Bachelor of Arts in Education

The objective of programs leading to the degree of Bachelor of Arts in Education is to provide (1) general educational backgrounds; (2) functional command of ideas, concepts, knowledge, and skills in one or more teaching fields; (3) mastery of basic professional information and skills adequate for the beginning teacher; and (4) development of attitudes needed for success in teaching.

The general educational backgrounds needed by prospective teachers are obtained through: precollege education, college courses, work experience, leadership activities, student campus activities, and off-campus cultural opportunities.

Normally, from 60 to 64 semester hours of the total requirement are completed in the lower division of Columbian College of Arts and Sciences of this University or in an equivalent institution elsewhere. (See "Education", pages 54–55.) Since the teaching fields differ in content, scope, and complexity, some programs are longer

than others. None requires less than 126 hours of satisfactory work, exclusive of required Physical Education. All candidates are required to take and make a satisfactory score on the common part of the National Teacher Examinations.

Teaching-field requirements include satisfactory completion of prescribed academic courses in one or more fields, a satisfactory score on the special field examination of the National Teacher Examinations if available*, and satisfactory completion of the prescribed special methods courses. Programs of study are available in the following fields: art, biology†, business education, chemistry, elementary education, English, French, general science, geography, German, history, mathematics, physical education, physics, Russian, social studies, Spanish, and speech. (See the School of Education separate catalogue for the prescribed courses in these fields.)

The student preparing to teach on the secondary level may be required to complete the prescribed courses in a minor as well as a major field. The student preparing to teach on the elementary level should use free electives within an academic field or area of specialization.

Professional Education

The basic professional information, skills, and attitudes needed by beginning teachers are provided through a sequence of courses to be taken in the junior and senior years. Lectures and class discussions are closely coordinated with field work. Instruction is differentiated to meet the needs of those preparing to teach on the various levels—elementary school, junior high school, senior high school, and adult.

PROFESSIONAL COURSES—SECONDARY		Semester Hours
Education 108:	Human Development, Learning, and Teaching	3
Education 112:	Educational Measurement, or	
Statistics 104:	Statistics in Psychology and Education I	3
Education 123:	Society and the School	3
Education 131:	Principles and Methods of Secondary School Teaching	3
Education 134:	Student Teaching in Secondary Schools	6–9
Three to six semester hours from the following Special Methods courses		3–6
Education 136:	Teaching English	
Education 137:	Teaching Speech	
Education 138:	Teaching Social Studies	
Education 140:	Teaching Mathematics	
Education 144:	Teaching Science	
Education 146:	Teaching Foreign Languages	
Education 150:	Teaching Business Subjects	
Total		21–27

PROFESSIONAL COURSES—ELEMENTARY		
Education 108:	Human Development, Learning, and Teaching	3
Education 111:	Methods in Elementary Education	12
Education 112:	Educational Measurement, or	
Statistics 104:	Statistics in Psychology and Education I	3

* Special field examinations of the National Teacher Examinations are available in Elementary Education; Early Childhood Education; Biology and General Science; English Language and Literature, Industrial Arts; Mathematics; Chemistry, Physics, and General Science; Social Studies; Physical Education; Business Education; Music Education, Home Economics; and Art Education. Students preparing to teach History or Geography will take the special field examination in Social Studies. Students preparing to teach in fields in which special NTE field examinations are not available (Languages and Speech) must obtain a satisfactory score on a special field examination given by the instructor in the special methods course involved.

† This is an interdepartmental field offered by the departments of Botany and Zoology.

		Semester Hours
Education 123:	Society and the School	3
Education 135:	Student Teaching in Elementary Schools	9
Total		30

Bachelor of Science in Home Economics*

The curriculum leading to this degree is designed to prepare young women for the important responsibility of home-making. The program can be adapted, however, to meet special requirements in nutrition, dietetics, clothing, and other related fields. Each student must plan her work with the assistance of a faculty adviser in the Department of Home Economics.

General Home-Making

JUNIOR YEAR	Semester Hours	SENIOR YEAR	Semester Hours
Home Economics 53	3	Home Economics 152	3
Home Economics 72	3	Home Economics 171	3
Home Economics 102	3	Home Economics 181	3
Home Economics 123	3	Home Economics 192	3
Physiology 115	3	Home Economics 197–98	6
Elective	15	Elective	12
Total	30	Total	30

Bachelor of Science in Physical Education for Men

There are three curricula leading to this degree†. The curriculum in Physical Education with an academic minor is designed to prepare students for teaching positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The Physical and Health Education curriculum prepares for the teaching of physical and health education in the larger schools. The curriculum in Physical Education and Recreation has been planned for those who wish to be prepared to direct programs of recreation in addition to the teaching of physical education.

The minimum requirements for this degree are 66 semester hours, distributed as follows:

Curriculum in Physical Education with an Academic Minor

JUNIOR YEAR	Semester Hours	SENIOR YEAR	Semester Hours
Education 108	3	Education 131	3
Education 123	3	Education 134	6–9
Physical Education 105	3	Physical Education 103	3
Physical Education 107	1	Physical Education 115–16	4
Physical Education 113–14	4	Phvsical Education 131	3
Physical Education 121–22	6	Physical Education 138	3
Physiology 115	3	Academic teaching field	8–11
Academic teaching field	4		
Elective	6	Total	33
Total	33		

* Open only to students enrolled in the Home Economics curriculum of the lower division of Columbian College of Arts and Sciences as of September 1961 or earlier. This degree will be conferred for the last time June 1965.

† Candidates for the degree of Bachelor of Arts in Education may also prepare to teach Physical Education in secondary schools as a minor teaching field. Those preparing to teach in the elementary school may choose Physical Education as an area of specialization. For detailed requirements see School of Education separate catalogue.

Curriculum in Physical and Health Education

JUNIOR YEAR	Semester Hours
Education 108	3
Education 123	3
Physical Education 107	1
Physical Education 109–10	4
Physical Education 113–14	4
Physical Education 121–22	6
Physiology 115	3
Elective	9
Total	33

SENIOR YEAR	Semester Hours
Education 131	3
Education 134	6–9
Physical Education 103	3
Physical Education 105	3
Physical Education 115–16	4
Physical Education 131	3
Physical Education 138	3
Elective	5–8
Total	33

Curriculum in Physical Education and Recreation

JUNIOR YEAR	Semester Hours
Education 108	3
Education 123	3
Physical Education 48	2
Physical Education 107	1
Physical Education 109–10	4
Physical Education 113–14	4
Physical Education 121	3
Physical Education 132	1
Physical Education 151–52	6
Elective	6
Total	33

SENIOR YEAR	Semester Hours
Education 131	3
Education 134	6–9
Physical Education 103	3
Physical Education 122	3
Physical Education 131	3
Physical Education 138	3
Physical Education 161	3
Physical Education 162	3
Elective	3–6
Total	33

Bachelor of Science in Physical Education for Women

The Physical Education major curriculum is designed to prepare students for teaching in elementary and secondary school programs of physical education.

Within this curriculum there is opportunity for specialization in dance, corrective physical education, health education, and recreation.

The student wishing to prepare to teach another subject in addition to physical education may do so by using her elective hours to work toward a minor teaching field. Relevant work completed in Columbian College of Arts and Sciences may be counted.

JUNIOR YEAR	Semester Hours
Education 108	3
Education 123	3
Physical Education 105–6	6
Physical Education 111–12	4
Physical Education 117–18	2
Physical Education 122	3
Physical Education 132	1
Physiology 115	3
Elective or minor teaching field	9
Total	34

SENIOR YEAR	Semester Hours
Education 131	3
Education 134	6–9
Physical Education 101	3
Physical Education 103	3
Physical Education 107	1
Physical Education 113	3
Physical Education 131	3
Physical Education 138	3
Elective or minor teaching field	4–7
Total	32

THE DEGREE OF MASTER OF ARTS IN EDUCATION

Programs of study leading to the degree of Master of Arts in Education are designed to enable prospective teachers and teachers of experience to increase their knowledge of professional and academic information and skills, prepare for special

types of educational service, and provide opportunities for graduates of liberal arts or other nonteacher education institutions to acquire needed professional education.

From the various related departments of the University, the student and his adviser select courses to give the student an adequate background in his chosen field of service. The prospective high school or junior high school teacher will ordinarily include study in the subject which he is planning to teach as well as in professional education.

Programs for teachers-in-service and experienced teachers planning to re-enter the profession are differentiated from those for students without teaching experience. Additional information concerning these programs may be obtained by writing or telephoning to the Dean.

Graduate programs of study are available in the following fields: (1) adult education, (2) classroom teaching—to include strengthening mastery of teaching field, (3) comparative education, (4) curriculum, (5) elementary education, (6) employee training, (7) guidance, (8) history of education, (9) philosophy of education, (10) reading, (11) school administration—secondary or elementary school principalship, and (12) secondary education.

Admission to Candidacy

The requirements for admission to candidacy for the Master's degree are stated on page 16. Those wishing to prepare for careers in guidance or administration must have had at least two years of successful teaching experience. Candidates whose undergraduate preparation does not include equivalents of the basic requirements of the Bachelor of Arts degree in Education must make up deficiencies.

Advanced Standing

For the record, advanced standing is granted for approved courses taken at other accredited institutions, but a minimum of 30 semester hours must be completed at this University as a matriculated candidate for the degree.

Advanced courses completed in this University in excess of the requirements for the Bachelor's degree may be credited toward the Master's degree to the extent of 12 semester hours, if the work fits in with the student's plan of specialization and is approved in writing by the Dean before being undertaken.

Advanced standing is not granted for work completed three or more years before application for admission or readmission to Master's candidacy.

REQUIREMENTS FOR THE DEGREE

Plan of Study

The plan of study leading to the degree of Master of Arts in Education requires a minimum of 33 hours of graduate credit. The plan may, at the student's option, include a thesis carrying 6 hours of graduate credit. Whether or not a student selects the thesis option, a minimum of 18 hours, including a course in educational research methods and procedures, must be from courses planned primarily for graduate students (third group courses). A minimum of 12 hours, not including the thesis or the research course must be from courses offered by the Department of Education.

Programs may include additional teaching-field preparation. In such cases, however, undergraduate and graduate courses combined must be at least equivalent to the undergraduate requirements for the degree of Bachlor of Arts in Education (see pages 120–22).

Programs are planned initially in conference with an admission adviser in the Office of the School of Education and subsequently with a designated adviser in the candidate's area of specialization. They take into consideration the interests of the candidate, the previous background, certification requirements of the state and locality in which he plans to teach.

All degree requirements must be completed within a period of six years after admission to study.

Residence

The satisfactory completion of 30 semester hours while a matriculated candidate for the degree is required. With the approval of the adviser, 9 of the 30 hours may be in the Off-Campus Division of the College of General Studies.

The Thesis

If a candidate selects the thesis option, the thesis must conform to standards prescribed. A statement of these standards may be obtained at the Office of the Dean.

The choice of the thesis subject must be approved in writing by the student's adviser and filed in the Office of the Dean no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 43) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period he must register for it again and pay tuition on the same basis as far a repeated course.

Comprehensive Examination

In addition to the course examinations, the candidate must pass a comprehensive examination in two parts: (1) a general three-hour examination concerned with an integrated understanding of the foundations of professional education, and (2) a special three-hour examination concerned with the candidate's area of specialization. For additional information, see the separate catalogue of the School of Education.

Five-year Program

A candidate entering the School of Education from the lower division of Columbian College of Arts and Sciences (or with equivalent preparation) may choose a three-year program leading to the degrees of Bachelor of Arts and Master of Arts in Education to be conferred simultaneously. The first year of this combined program will be devoted to teaching-field preparation; the work of the second year will include the Bachelor of Arts junior-year professional courses and a maximum of 18 semester hours of graduate courses; that of the third and final year, senior-year undergraduate professional courses and the remaining graduate courses needed for the Master's degree. Student Teaching, to be elected in the third year, may not be taken for graduate credit. A quality-point index of at least 2.50 in undergraduate courses must be attained before beginning the work of the senior year and the program must meet all the requirements for the degrees of Bachelor of Arts and Master of Arts in Education.

THE ADVANCED PROFESSIONAL CERTIFICATE

This program is designed to prepare teachers for more effective service in their chosen fields and to enable them to qualify for a higher step in the local salary scale.

The program of studies leading to the Certificate is selected by the candidate and his adviser from the various related departments of the University in accordance with the student's needs. In general it includes 30 hours of graduate credit beyond the Master's degree. The candidate wishing to increase his teaching proficiency may include additional study in his teaching field. For information concerning available programs, see the separate catalogue of the School of Education.

Admission to Candidacy

The requirements for admission to candidacy for the Advanced Professional Certificate are stated on pages 16–17. The applicant who is unable to meet the admission requirements may be admitted with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education.

Advanced Standing and Transfer of Credit

Advanced standing is granted for appropriate graduate work completed in other accredited higher institutions. However, a minimum of 18 semester hours must be completed at this University as a matriculated candidate in the School of Education. The candidate is encouraged to include in his program study at other accredited higher institutions when such study seems to be in his best interest. Advanced standing is not granted for work completed three or more years before application for admission or readmission.

Requirements for the Certificate

Plans of Study

In planning his program the candidate should give first consideration to his particular needs. If his study for the Master's degree was largely in professional education, he may need courses in his teaching field. If his Master's preparation was in a content field, he may need professional study.

The program must include, in addition to any prerequisites, a minimum of 30 hours of graduate credit, 24 hours of which must be in third-group courses (or the equivalent at other institutions). A maximum of 6 semester hours of graduate credit in second-group courses may be included and a minimum of 12 hours in courses offered by the School of Education must be included.

Residence

Candidates for the Advanced Professional Certificate must complete satisfactorily at this University a minimum of 18 semester hours in courses offered on the campus. The balance of the program may include courses in the Off-Campus Division of the College of General Studies or in other approved institutions of higher learning. The candidate is not required to pursue his program of study continuously. On request, a leave of absence is granted for a period not to exceed three years.

THE DEGREE OF DOCTOR OF EDUCATION

The School of Education offers programs of advanced study leading to the degree of Doctor of Education. These programs are under the supervision of the Committee

on Graduate Studies and provide opportunities for study leading to the following professional objectives: school superintendent, secondary school principal, elementary school principal, supervisor, director of guidance, director of curriculum development, professor of education, specialist in educational research, employee training, or adult education. All programs require study of interrelated areas of education as well as a doctoral dissertation in the major field of study.

Each program is divided into two parts. The first consists of preparation for and the passing of comprehensive examinations in each of four supporting fields and a major field of study. The second is composed of research investigation and the writing of a dissertation in the major field of interest and culminates in the final oral examination.

Detailed information on programs is provided in a separate publication obtainable on request.

Admission

The applicant must possess adequate preparation for advanced study including graduate work in fields prerequisite to his objective equivalent to that required for the degree of Master of Arts in Education at this University, at least three years of successful pertinent educational experience, acceptable personal qualities, and a capacity for creative scholarship and effective leadership.

The applicant first arranges for an interview with the Assistant Dean for Advanced Graduate Studies to explore his needs in relation to the resources of the School of Education and to provide the guidance needed to proceed with an application for advanced study.

To be admitted to study for the degree, the applicant must be accepted by the Committee on Graduate Studies on the basis of (1) his previous scholastic and professional record; (2) the results of prescribed admission tests including the Aptitude Test of the Graduate Record Examination; (3) individual evaluation through personal conferences with at least three faculty members including the major professor under whom the applicant wishes to pursue his work; and (4) the outcome of a group interview with the Committee on Graduate Studies.

The responsibility for selection of supporting and major fields rests with the candidate. Each applicant when he appears before the Committee on Graduate Studies should be prepared to present an outline of his plan of study including the selection of major and supporting fields and the tools of investigation needed for the completion of a doctoral dissertation. The tools may include one foreign language or more, statistical methods, or historical criticism. Candidates with less preparation than that normally required for a Bachelor's and Master's degree in Education must make up their deficiencies either prerequisite to or as part of their graduate work.

Study for the Major and Supporting Field Examinations

The requirements for the degree of Doctor of Education cannot be stated in semester hours, but they consist in general of at least two to three years of full-time work, or the equivalent in part-time work, beyond the degree of Master of Arts in Education. Upon admission to study for the first part of a doctoral program the applicant is assigned to a Committee which prescribes and directs his studies. The Committee is composed of professors who will direct the student's work in the major and four supporting fields. Preparation for and the passing of supporting field examinations precedes preparation for and taking the final examination in the major field.

A student is required to consult individually with supporting and major field pro-

fessors in order to determine the requirements for each field of study and to receive guidance in preparation for each examination. Supporting field examinations are written and are six hours in length. The major field examination is twelve hours in length, six hours on each of two successive days. Upon satisfactory completion of all supporting and major field examinations the student, upon recommendation of the Committee on Graduate Studies, is permitted to pursue the second part of his doctoral program.

The Dissertation and the Final Examination

The student permitted to continue the second part of a doctoral program is assigned to a Master in Research, generally the major field adviser. Throughout the remainder of the program, the candidate is responsible solely to his Master in Research. Two additional faculty members assist the Master in reading the first draft of the candidate's dissertation. When the dissertation is considered acceptable, the Master recommends the candidate to the Dean for the final oral examination.

The final oral examination must be passed at least three weeks before the degree is to be conferred. The examination is conducted by a committee of the Faculty appointed by the Dean, supplemented by at least two leaders in the candidate's field of study from outside the University. The examination is open to the public. Candidates who successfully pass the oral examination are recommended for the degree by the Faculty of the School of Education.

Residence and Continuous Study

All the preparation for the degree must be done in residence. The student must maintain continuous registration in the School of Education, except when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year may result in lapse of candidacy. Subsequent readmission is subject to whatever new conditions and regulations have been established by the Committee on Graduate Studies.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the minor and supporting field examinations or as a candidate engaged in doctoral research. The supporting and major field examinations, however, must be completed within five years of the date of admission and the entire program must be completed within eight years, regardless of full-time or part-time study. Each candidate is required to complete one semester or more of his program in full-time study. Full-time study in two nine-week Summer Sessions is equivalent to full-time study for one semester.

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

THE FACULTY AND STAFF OF INSTRUCTION*

A. M. Woodruff, *Dean;* L. W. Williams, *Assistant Dean*

* The president of the University, the Dean of Faculties, the Dean and Assistant Dean of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

This listing of Faculty and Staff of Instruction is for the academic year 1961–62.

Professors J. W. Brewer, H. F. Bright, D. S. Brown†, A. E. Burns‡, R. D. Campbell, T. H. Carroll, R. H. Davison, J. C. Dockeray, Mitchell Dreese§, R. B. Eastin, J. O. Eaton, R. F. Ericson, D. C. Faith, C. E. Galbreath, H. L. Geisert, F. H. Gibbs, Wood Gray, T. W. Holland, Thelma Hunt, G. C. Jacobus, J. L. Jessup, A. R. Johnson, E. L. Kayser, J. W. Kendrick, R. D. Kennedy, W. H. Kraus, W. K. Legner, E. J. B. Lewis, G. L. Lippitt, H. M. Merriman, Wilson Schmidt, W. L. Tayler, D. S. Watson, A. M. Woodruff

Professorial Lecturers S. N. Alexander, C. G. Berns, F. C. Brimacombe, J. L. Buckler, C. W. Clewlow, L. C. Collins, Gerhard Colm, F. V. Demaret, S. W. Greenhouse, L. W. Hamilton, Hans Heymann, Jr., Frank Higginbotham, C. E. Houston, H. F. Hubbard, R. A. Kaye, J. L. Krieger, Solomon Kullback, K. F. McClure, Edward McCrensky, C. A. McLaughlin, J. P. Murphy, M. E. Ogdon, W. J. Peeples, F. M. Riddick, F. I. Shaffner, C. L. Simpson, I. E. Steele, J. N. Stonesifer, K. E. Stromsem, W. G. Torpey, R. A. Young

Associate Professors T. R. Bennett II, John Clayton, D. R. Cloutier, W. C. Davis, L. I. Gintzig, R. C. Haskett, R. S. Jordan, F. C. Kurtz, H. L. LeBlanc, H. R. Ludden, J. N. Mosél, Benjamin Nimer, Leonard Prestwich, J. W. Skinner, Waldo Sommers, R. B. Thompson, H. W. Westermann, Helen Yakobson

Associate Professorial Lecturers H. M. Bain, R. C. Bain, O. C. Disler, Seymour Geisser, C. E. Goode, George Idelson, V. B. Lewis, F. K. McTyier, J. A. Morrow, Ross Pollock, John Provan, J. R. Snitzler, William Spencer

Assistant Professors R. E. Griffiths, A. D. Larson, H. R. Page, R. E. Thomas

Lecturers R. J. Bond, J. F. Doubleday, D. K. Good, W. L. Jobanek, C. H. Slayman, A. C. Stedry

Instructor M. G. Gallagher

COMMITTEES‖

Dean's Council for Programs in Business and Public Administration

R. B. Eastin, F. H. Gibbs, A. R. Johnson, R. D. Kennedy, Waldo Sommers

Dean's Council for Programs in Public and International Affairs

H. F. Bright, W. H. Kraus, H. L. LeBlanc, H. M. Merriman, Wilson Schmidt

Committee on Admission and Advanced Standing

Waldo Sommers *(Chairman)*, J. W. Brewer, R. B. Eastin, H. M. Merriman

Committee on Curriculum and Programs

J. W. Brewer *(Chairman)*, J. C. Dockeray, A. R. Johnson, E. H. Johnson, R. D. Kennedy, D. S. Watson

Committee on Doctoral Studies

J. C. Dockeray *(Chairman)*, R. B. Eastin, E. H. Johnson, R. D. Kennedy, D. S. Watson

Committee on Management Research

J. C. Dockeray *(Chairman)*, E. H. Johnson, R. D. Kennedy, D. S. Watson

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‡ On sabbatical leave spring semester 1961–62.
§ On leave of absence academic year 1961–62.
‖ The Dean and Assistant Dean of the School are members ex officio of all committees.

GENERAL INFORMATION

INTRODUCTORY

The School of Government, Business, and International Affairs offers undergraduate and graduate work in two groups of integrated programs: public and international affairs and the theory and administration of government and business.

The purpose of the School is to give the student an understanding of his responsibilities under the Constitution of the United States in the conduct of public office, domestic and foreign, and also to prepare students for careers in governmental service and in related business and professional fields.

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES *are stated on pages 8–23; other University regulations, on pages 39–45*

AMOUNT OF WORK

A full-time student not on probation may not ordinarily take more than 15 semester hours. A student employed more than 24 hours a week, who is not on probation, may not take more than 9 semester hours.

A full-time student whose qualify-point index is 3.50 or higher may take not more than 18 semester hours. A student employed more than 24 hours a week, whose index is 3.50 or higher, may take up to 12 semester hours.

A student who accepts employment after registration or at any time during a semester must report immediately to the Dean, so that his program may be adjusted if necessary.

Exception to these rules will require the approval of the Dean.

ATTENDANCE

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provision is made for him to make up the work missed.

INDEPENDENT STUDY PLAN

A student of *demonstrated capacity*, with a special interest in the subject matter of a course, may be permitted to undertake study under the personal direction of an instructor, in accordance with the rules of the appropriate department. Credit under this plan is limited to the specific course credits normally allowed when taken on a class basis.

THE BACHELOR'S DEGREES

The School offers programs leading to (1) the degree of Bachelor of Arts in Government with majors in International Affairs or Public Affairs and (2) the degree of Bachelor of Business Administration with majors in Accounting, Business Administration, and Business and Economic Statistics.

REQUIREMENTS FOR THE DEGREES

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 39 and 40.

In order to graduate, a student must have the following: (1) a general quality-point index of at least 2.00 and (2) an index in his major of at least 2.50. The major includes the required courses and courses taken in the group options.

Dean's Honor List.—The names of students who achieve a quality-point index of 3.50 or higher are placed on the Dean's Honor List for that semester. Appearance on the List will be limited to (1) full-time students registered for a minimum of 12 semester hours and (2) part-time students registered for a minimum of 12 semester hours over a period of two consecutive semesters, which may include the summer term.

Probation.—A student must maintain a quality-point index of at least 2.00, or be placed on probation, where he remains as long as his index is below 2.00.

Suspension.—A student whose index is 1.50, or who is placed on probation for a third semester, whether successive or after an interval, is suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University, he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

Examinations for Waiving Curriculum Requirements

A required course may be waived by the satisfactory passing of a waiver examination authorized and prescribed by the department or curriculum adviser concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Request to take the examination should be made to the curriculum adviser and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

Graduate Record Examinations

During the final semester of the senior year students are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities. (For further information concerning the Graduate Record Examinations, see page 43.)

Residence

For residence requirements, see the University regulations on page 42.

Curriculum Requirements

To be recommended by the Faculty for graduation, candidates are required to complete, in addition to the appropriate freshman and sophomore work, a minimum of 60 semester hours during the junior and senior college years, as set forth in one of the following curricula.

BACHELOR OF ARTS IN GOVERNMENT

International Affairs

The international affairs program is broad, covering international political relations, international trade and finance, international communications, and regional

studies. Its purpose is to equip students, by providing general background and specialized work, for careers in the field of American foreign relations. The diplomatic service of the United States, the several agencies of government with rsponsibilities in the international field, the international organizations, and American enterprise abroad offer opportunities in this field.

		Semester Hours
Econ. 181–82	International Economics	6
Hist. 181–82	Diplomatic History of the United States	6
Pol. Sc. 171	International Politics	3
or Hist. 150	European Diplomatic History since 1878	3
Pol. Sc. 172	International Organization: the United Nations	6
Pol. Sc. 181–82	International Law	3
Pol. Sc. 197	Proseminar in International Affairs	6
Foreign Language	Composition and Conversation	3
Geography		
Group Option	(To be selected from one of the following groups in consultation with adviser)	15
Electives		9
	Total	60

All international affairs majors must complete the *required* courses listed above, plus the group option. Group option courses must be selected after consultation with the adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained for such modification of the option selected.

Group I—International Politics

Composed of courses in political Science, History, and Geography concerned with the study of American diplomatic relations.

Group II—International Economics

Composed of courses in Economics and Business and Public Administration concerned with the study of American economic, financial, and business relationships with foreign countries.

Group III—International Communications

Composed of courses in Political Science, Psychology, Sociology and Anthropology, and Journalism concerned with the study of international information programs, public opinion, psychological warfare, cultural relations, and public relations. (It is recommended that the student include statistics in his freshman- and sophomore-year program.)

Group IV—Area or Regional Studies

Composed of courses in Economics, History, Political Science, and Geography. Integrated programs of study are available in the following regions or areas: Europe, Africa, and the Middle East; Asia and the Pacific Area; the Soviet Orbit; and Latin America. Modifications and combinations of these areas may be made if approved by the adviser. The foreign language requirement should be met by a language suitable for study of the region or area selected.

Public Affairs

The Public Affairs program is a broad, composite curriculum dealing with domestic government and policy.

		Semester Hours
Econ. 121	Money and Banking	3
Econ. 161–62	Public Finance and Taxation	6
Econ. 165	Government Control of Economic Activity	3
Hist. 172	Social History of the United States since 1861	
or Hist. 173	Representative Americans	
or Hist. 176	Political and Constitutional History of the United States since 1861	3

Pol. Sc. 121–22	The Constitution of the United States	6
Pol. Sc. 145	Political Parties and Politics	3
Pol. Sc. 151–52	Public Administration	6
Group Option	(To be selected from one of the following groups in consultation with adviser)	15
Electives		15
	Total	60

All public affairs majors must complete the *required* courses listed above. The group options provide specializations. Modifications and substitutions may be made when appropriate or necessary provided the consent of the adviser is obtained.

Group I—Economics Option

		Semester Hours
Econ. 101	Economic Analysis	3
Econ. 105	Business Cycles	3
Econ. 141	Unionism and Collective Bargaining	3
Econ. 142	Labor Economics	3
Hist. 174	Economic History of the United States	3
	Total	15

Group II—Politics Option

Hist. 175–76	Political and Constitutional History of the United States	6
Pol. Sc. 111	Introduction to Comparative Government	3
Pol. Sc. 118	Political Theory: the Nature and Growth of Political Thought and Politics in the West	
or Pol. Sc. 120	Foundations of American Democracy	3
Pol. Sc. 146	Political Pressures and Public Reactions	
or Psych. 156	Psychology of Propaganda and Public Opinion	3
	Total	15

BACHELOR OF BUSINESS ADMINISTRATION

The programs in business administration, accounting, and business and economic statistics stress breadth of preparation for eventual senior administrative responsibilities. Approximately two-thirds of each program is in liberal arts subjects.

Accounting

In accounting, the emphasis is on the managerial approach. At the same time the foundation is laid for a later professional career in the field with the C.P.A. designation. Many students qualify for this designation within a few months after graduation. The accounting curriculum provides considerable material in governmental accounting and controllership. The program requires 39 hours of substantive courses, plus 15 hours of option, plus 6 hours of electives, which normally are advanced courses in liberal arts subjects.

		Semester Hours
Acct. 101	Cost Accounting	3
Acct. 111	Financial Statement Analysis	3
Acct. 121–22	Intermediate Accounting	6
Acct. 161	Accounting Theory	3
Acct. 171	Income Tax Accounting	3
Acct. 181	Auditing	3
BA 102	Accounting Systems	3
BA 131	Fundamentals of Management	3
BA 161	Business Finance	3
	Commercial Law: Contracts, Sales, Agency, and Bailments	3

BA 162	Commercial Law: Negotiable Instruments, Property, Mortgages	3
Econ. 121	Money and Banking	3
		39
Group Option (to be selected from one of the following groups)		15
Electives (to be selected in consultation with the adviser)		6
	Total	60

All accounting majors must complete the *required* courses listed above, plus the group option. Group option courses must be selected after consultation with the adviser.

Group I—Public Accounting
Composed of courses in Accounting and Business and Public Administration.

Group II—Commercial and Industrial Accounting
Composed of courses in Accounting, Business and Public Administration, Economics, and Statistics.

Group III—Governmental Accounting and Budgeting.
Composed of courses in Accounting, Business and Public Administration, Political Science, and Economics.

Business Administration

The program in business administration is designed to provide the broad foundation required for eventual top leadership in either governmental or business administration. Thirty semester hours of substantive courses are required. In addition students take 15 semester hours in one of the group options and 15 hours of electives, which normally are advanced courses in liberal arts subjects.

		Semester Hours
BA 101	Introduction to Business	3
BA 102	Fundamentals of Management	3
BA 105	Personnel Management	3
BA 131	Business Finance	3
BA 141	Principles of Marketing	3
BA 161	Commercial Law: Contracts, Sales, Agency, and Bailments	3
BA 162	Commercial Law: Negotiable Instruments, Property, Mortgages	3
BA 198	Case Problems in Management	3
Acct. 193	Business Budgeting	3
Econ. 121	Money and Banking	3
		30
Group Option (to be selected from one of the following groups)		15
Electives (to be selected in consultation with the adviser)		15
	Total	60

All business administration majors must complete the *required* courses listed above, plus the group option. Selection of group option courses must be made in consultation with the adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained if the student wishes such modification of his option group.

Group I—General Business
Composed of courses in Accounting, Business and Public Administration, Economics, and Statistics.

Group II—Personnel Management
Composed of courses in Business and Public Administration, Economics, Psychology, Speech, and Statistics.

Group III—Finance
Composed of courses in Accounting, Business and Public Administration, Economics, Political Science, and Statistics.

Group IV—Marketing
Composed of courses in Business and Public Administration, Economics, Geography, and Statistics.

Group V—Controllership
Composed of courses in Accounting, Business and Public Administration, and Economics.

Group VI—Economics
Composed of courses in Economics and Business and Public Administration.

Group VII—Statistics
Composed of courses in Statistics

Group VIII—Transportation and Public Utilities
Composed of courses in Business and Public Administration, Economics, Geography, History, and Statistics.

Foreign Commerce.—Business Administration majors who wish to specialize in foreign commerce may request a modification of the above requirements. The modified major excludes some of the above required courses and adds others, such as a third year of foreign language, foreign markets, exporting and importing, economic geography, and other courses relating to overseas trade. Each program must be approved by the adviser.

Business and Economic Statistics

The undergraduate program of business and economic statistics, is designed as preparation for business and economic analysis, with 30 hours of substantive requirements and 30 hours of electives from Accounting, Business Administration, Economics, and Statistics.

		Semester Hours
Stat. 111–12	Business and Economic Statistics I-II	6
BA 101	Introduction to Business	3
BA 102	Fundamentals of Management	3
BA 131 or 141	Business Finance	
BA 161–62	Principles of Marketing	3
Econ. 101–2	Commercial Law	6
Econ. 105	Economic Analysis	6
Electives (A)	Business Cycles	3
Electives (B)	(To be selected from Statistics)	18
		12
	Total	60

THE MASTER'S DEGREES

The School of Government, Business, and International Affairs offers programs leading to (1) the degree of Master of Arts in Government with major fields in International Affairs, Public Affairs, Public Administration, Personnel Administration, and Economic Policy and (2) the degree of Master of Business Administration with major fields in Accounting, Business and Economic Statistics, General Business Administration, Hospital Administration, and Personnel Administration.

Admission to Graduate Study

A 3.00 average in the undergraduate major is normally required for admission to graduate study. Deficiency in undergraduate preparation may be satisfied by (1) taking specified undergraduate courses and maintaining a 3.00 average in such courses or (2) passing a comprehensive examination in the major field. The comprehensive examination may be taken only with the Dean's approval upon recommendation of the curriculum adviser.

Admission to Candidacy

A student is recognized as a candidate for a Master's degree only when his application for candidacy has been approved.

Language Requirement.—A candidate for the degree of Master of Arts in Government with a major field in International Affairs, Public Affairs, or Economic Policy must show that he has a reading knowledge (certified by the appropriate language department) of at least one modern foreign language, to be approved by the Dean. The language examination should be taken before the student begins the second 15 hours of his work. No student may take the examination after three unsuccessful attempts.

Requirements for the Degrees

The Master's degrees are based on completion of prescribed course work, the comprehensive examination, and thesis. The minimum Master's program is 30 semester hours of which 6 represent the thesis. Applicants whose undergraduate training does not include background courses necessary before taking the comprehensive examination must undertake programs longer than the 30-hour minimum.

Second-group courses (numbered 101–200) may be counted toward the Master's degree up to a maximum of 12 hours, but only when registration for advanced credit has been approved at the beginning of the course by the curriculum adviser. No work counted toward a Bachelor's degree may also be counted toward a Master's degree.

All work for a Master's degree must be completed in three years, unless an extension of time is granted by the Dean. Validation examinations may be required.

In addition to any course examinations, the candidate must pass a comprehensive written examination in his major field. These examinations are scheduled two or more times a year (usually in December and in April), and should be taken during the last semester of course registration or shortly after the completion of the prescribed course work. The candidate must consult with his adviser, well in advance, as to the date of his examination and the definition of the subject-matter fields which this examination is to cover. An oral examination on his thesis may also be required.

A student who expects to continue his studies for the degree of Doctor of Philosophy (Graduate Council) or Doctor of Business Administration, after receiving the Master's degree, will be assisted in planning his program so that he may qualify for admission to candidacy for the Doctorate.

Core Courses in Administration

Breadth and background in general administration theory and practice is provided by core courses required of all graduate degree candidates in Public Administration, Business Administration, Personnel Administration, and Hospital Administration. These courses are designed to stimulate the student to become "management conscious", regardless of the field of his future endeavors. The required courses are:

BPA 201 Advanced Administrative Management (3)
BPA 204 Quantitative Factors in Administration (3)
BPA 207 Human Relations in Administration (3)

In addition, as part of the core courses, each student generally will be required to take one of the following courses appropriate to his specific area of concentration:

BA 297 Case Studies in Business Administration (3)
HA 206 Case Studies in Hospital Administration (3)
PA 212 Case Studies in Public Administration (3)

Residence

No credit is granted for work done *in absentia*, i.e., without formal instruction, except for the thesis, which may be completed *in absentia* with the permission of the department, curriculum adviser, or committee concerned.

Scholarship

Grades for graduate work are *E*(excellent), *S*(satisfactory), *U*(unsatisfactory), and *I*(incomplete); for further details, see pages 39–40. A minimum of 6 of the first 30 semester hours of course work completed in the Master's program must be graded *E*.

A Master's candidate who has accumulated more than 6 semester hours of *U* will be automatically suspended.

The Thesis

The student who plans to complete work for a Master's degree in one year should register for the thesis at the beginning of the year; otherwise he should be registered for it not later than the beginning of the final year. The choice of the thesis subject must be approved by the professor in charge and recorded in the Office of the Dean by the date announced in the University calendar. The thesis in its final form must have the approval of the professor in charge and must be presented to the Dean by the student no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 43) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year is granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period, the student must reregister and pay tuition as for a repeated course.

MASTER OF ARTS IN GOVERNMENT

Curricula leading to the degree of Master of Arts in Government are available in the fields of International Affairs, Public Affairs, Public Administration, Personnel Administration, and Economic Policy, as described below.

The field of Personnel Administration, including options in Counseling and Psychometrics, is described on pages 141–42 and may lead to either the degree of Master of Arts in Government or the degree of Master of Business Administration.

International Affairs

Prerequisite: the applicant's undergraduate program must have included background courses corresponding to an undergraduate major in International Affairs at this University. Any course deficiency in the stated group of required courses of the undergraduate curriculum (except foreign language) must be made up.

The program in International Affairs is offered in four fields of specialization: International Economics, International Politics, International Communications, and Regional Studies.

International Economics.—Graduate courses in economics (numbered over 200) in the field of international trade, the balance of payments, international financial policies, and international economic policies form the principal part of this specialization. Graduate courses in economic theory are recommended. Other courses may be included with the consent of the adviser.

International Politics.—Graduate courses in political science and history (numbered over 200), in international law, international politics, international organization, diplomatic history, and American foreign policy, comprise the principal requirements for this specialization. Related courses may be added with the consent of the adviser.

International Communications.—Graduate courses (numbered over 200) in political science, psychology, sociology and anthropology, and geography with 12 hours (one-half of the course work) in the fields of public opinion, international information, psychological warfare, and communications, and 12 hours (one-half of the course work) in the fields of international politics and area studies. The adviser in all cases must approve the course selections.

Regional Studies.—Graduate courses in economics, political science, history, and geography (numbered over 200) dealing with a geographic region, such as Latin America; Europe, Africa, and the Middle East; Asia, the Soviet Orbit, or the Pacific Area, comprise the principal requirements. Other courses of broader scope in economics, history, and political science are recommended as part of the program. The adviser in all cases must approve such selections.

The listing of graduate courses for these fields of specialization is given in the departmental offerings for Economics, History, Political Science, Geography, Psychology, and Sociology and Anthropology.

Public Affairs

Prerequisite: an undergraduate major in public affairs, economics, history, or political science, depending upon the field of specialization. Any course deficiency in the Public Affairs Curriculum, as stated on pages 132–33 must be made up.

The program in Public Affairs is offered in two fields of specialization: Domestic Economics and Domestic Politics.

Recommended for Domestic Economics: courses in economic development, economic policy, public finance, and national income.

Recommended for Domestic Politics: courses in United States social, constitutional, and political history; comparative government; political theory; legislative organization; jurisprudence; political parties; and public opinion.

Public Administration

The purpose of the program in Public Administration is to prepare graduates to enter public service in the field of administration and to improve the competence of those already in public employment. The program assumes that effective performance at all levels of administration calls for an understanding of the human factors involved, a knowledge of the nature and institutional characteristics of administration in the public service, and an ability to apply the methods and techniques of management. An understanding of all three elements is provided by bringing together into the program different disciplines, including courses in political science, business and public administration, psychology, economics, accounting, and statistics.

Prerequisite: an undergraduate background in the social sciences or business administration.

The 30 hours of required work must include the thesis, Public Administration 299–300, and will normally include the core courses listed on page 136.

Economic Policy

Prerequisite: an undergraduate major in economics or the equivalent.

The 30 hours of required work must include Economics 210, 265–66; and the thesis, Economics 299–300.

Recommended: courses in income and employment, national income, business cycles, monetary and fiscal policy, economic theory, and statistics. These courses and others that may be appropriate are to be selected with the consent of the adviser.

MASTER OF BUSINESS ADMINISTRATION

Curricula leading to the degree of Master of Business Administration are available in the fields of Accounting, Business and Economic Statistics, General Business

Administration, Hospital Administration, and Personnel Administration, as described below.

The field of Personnel Administration, including options in Counseling and Psychometrics, is described on pages 141–42 and may lead to either the degree of Master of Arts in Government or the degree of Master of Business Administration.

Accounting

Prerequisite: an undergraduate major in accounting or the equivalent. The program in Accounting requires the following courses:

		Semester Hours
Acct. 231	Contemporary Accounting Theory	3
Acct. 295–96	Seminar in Accounting	6
Acct. 299–300	Thesis	6

Of the remaining 15 semester hours, 9 must be in accounting and 6 in related fields selected with the approval of the adviser.

Business and Economic Statistics

Prerequisite: an undergraduate major in Business and Economic Statistics, or the equivalent; such work must include a minimum of 24 semester hours of second group courses in statistics and a minimum of 10 semester hours in second-group courses in accounting, business administration, and economics.

This program requires at least 12 semester hours of graduate courses in statistics. The remaining 12 semester hours are to be selected from graduate work offered by the departments of accounting, business and public administration, economics, and statistics with the approval of the adviser.

General Business Administration

This curriculum provides the graduate student with instruction which will help him advance to responsible positions in business. The program is also valuable for many positions in government, particularly those in "business-type" operations.

The Master of Business Administration program is sufficiently flexible to meet the basic requirements of any vocational objective requiring a knowledge of management principles. While most students in this program will normally take the core courses, page 136, as well as other courses in Business Administration, the individual program should be planned with an adviser so as to include graduate courses offered by other departments wherever appropriate. Particular attention should be given the offerings under Public Administration, Economics, Accounting, Statistics, and Psychology.

The degree of Master of Business Administration is granted upon successful completion of a minimum of 24 hours of graduate courses and 6 hours of *Thesis*. Individual programs are planned in consultation with an adviser. Students who do not present satisfactory undergraduate majors will be required to take background courses, which will be selected in accordance with individual qualifications and work experience.

The thesis subject should be selected as early as possible so as to permit effective integration with the course work.

Hospital Administration*

This graduate program is designed to help prepare students who aim for positions of top leadership in hospital administration. Its curriculum is planned to give stu-

* Other health care administration programs, under the same Coordinator, relating to nursing homes, medical records, and facilities for the aged, are described in more detail on page 188.

dents an opportunity to acquire the knowledge, attitudes, and skills which will provide a foundation for their growth into capable administrators of hospitals and related institutions.

In view of the specific career objectives stated above, the requirements both in semester hours of course work and in resident study are greater than those of other fields in the Master of Business Administration Program. A minimum of 45 semester hours and a minimum of twenty-one months of study are required.

Work for the degree is divided into two phases. During the first phase a minimum of 36 semester hours of academic courses, adapted in accordance with each student's background needs, must be completed satisfactorily. These courses cover the general and technical background of hospital administration, general administrative theory and practice, and problem solving in the area of management as it relates to general and special hospitals (including mental hospitals), nursing homes, and similar institutions.

The second phase requires at least a full calendar year of on-the-job institutional training under qualified supervision. Students may not enter this phase until they have completed the requirements in phase one. During phase two, each student will be required to complete a major report. This written report will count as part of the 9 semester hours required for this phase. Selected students will take an additional 9 hours covering a full second year of residency. By special permission, additional research and course work may be substituted for a part of the clinical training. Each program is made out for the individual student in accordance with his experience, needs, and aims.

Full-time students should complete both phases for the degree in twenty-one months: part-time students in thirty-six months. Under special circumstances, additional time may be granted. No student will be admitted who does not plan to complete the entire program.

Prerequisite: a Bachelor's degree from an accredited college or university. While a 3.0 (*B*) average in the undergraduate major is expected, considerable weight will be given to personal qualifications, aptitude for hospital administration, and practical experience, in the selection of candidates.

Although students may be accepted with majors in any undergraduate field, a desirable background would include courses in accounting, biology, business administration, economics, psychology, sociology, and statistics. One semester courses in accounting and statistics *must* be taken prior to admission as a full-time graduate student. Applicants with academic deficiencies may be permitted to enroll as special students subject to the satisfactory completion of prescribed courses beyond the minimum requirements for admission.

The following courses are required in addition to the core courses, see page 136.

		Semester Hours
*BPA 268	Management Engineering	3
HA 202	Introduction to Medical Care Administration	3
HA 203–4	Hospital Organization and Management I-II	3–3
HA 205	Hospital Management Procedures	3
HA 207	Hospital Management Analysis	3
HA 209	Hospital Finance and Planning	3
†HA 293–94–95	Hospital Residency I	3–3–3
Elective		9

* Students who have had this course may substitute another third-group Hospital Administration course, with the approval of the Program Coordinator.

† The student must register for 9 semester hours of residency at the end of the first phase and before he leaves the University for his residency hospital. Registration for 1963–64 will be held May 24, 1963.

Personnel Administration

This program, including options in Counseling and Psychometrics, instructs students in underlying principles and techniques. The program leads to the degree of Master of Arts in Government if elective courses are directed toward Public Administration. It can also lead to the degree of Master of Business Administration if elective emphasis is directed toward Business Administration. Courses are to be selected from the following, with the approval of the adviser.

A student enrolled in this program will normally be required to take the core courses listed on page 136.

		Semester Hours
BPA 206	Personnel Management	3
BA 209	Seminar in Personnel Management	3
BA 210	The Personnel Manager	3
PA 212	Case Studies in Public Administration	3
PA 232	Federal Personnel Procedures	3
PA 233	Seminar in Manpower Development and Utilization	3
PA 272	Seminar in Public Personnel Administration	3
Econ. 241	Labor Economics	3
Econ. 244	Collective Bargaining	3
Psych. 227	Seminar: Counseling and Guidance	3
Psych. 244	Seminar: Job Analysis and Evaluation	3
Psych. 245	Seminar: Employee Motivation and Morale	3
Psych. 246	Seminar: Personnel Measurement Techniques	3
BA 299–300	Thesis,	
PA 299–300	Thesis,	
or		
Psych 299–300	Thesis	6

Counseling Option

Prerequisite: an undergraduate major in psychology, business administration, or education; or an undergraduate major in the social sciences appropriate to specialization in this field. The undergraduate background should include necessary basic training in such fields as psychology, sociology, statistics, labor economics, and business management or public administration.

The Master of Arts program in Counseling requires the following courses:

		Semester Hours
Psych. 220	Seminar: Abnormal Psychology	
or		
Psych. 225	Seminar: Mental Hygiene	3
Psych. 227	Seminar: Counseling and Guidance	3
Psych. 228	Seminar: Techniques of Counseling	3
Psych. 229	Seminar: Occupational and Educational Information	3
Psych. 236	Seminar: Analysis of the Individual for purposes of Counseling	3
Psych. 299–300	Thesis	6

The remaining 9 hours are elective, with the approval of the adviser.

Psychometrics Option

Prerequisite: an undergraduate major in psychology, statistics, or the social sciences which includes twelve credits in psychology (general psychology, tests and measurements, personnel psychology, and related psychology courses); general statistics; mathematics through college algebra (preferably through calculus).

The Master of Arts program in Psychometrics requires the following courses:

		Semester Hours
Psych. 231	Test Construction	3
Psych. 234	Seminar: Test Theory	3
Psych. 246	Seminar: Personnel Measurement Techniques	3
Psych. 299–300	Thesis	6
Stat. 105	Statistics in Psychology and Education II	3
Stat. 117	Analysis of Variance I	3
Stat. 118	Correlation and the Chi-square Test I	3

The remaining 6 hours are elective, with the approval of the adviser.

DOCTOR OF BUSINESS ADMINISTRATION

The work for this degree is under the supervision of the Committee on Doctoral Studies of the School of Government, Business, and International Affairs.

An applicant must have the degree of Master of Business Administration, Master of Arts in an approved field, or the equivalent of such degrees, together with acceptable personal qualities and a capacity for creative scholarship. Each applicant must demonstrate his competence in Statistics and Accounting by qualifying examinations.

After admitting an applicant, the Committee on Doctoral Studies, in consultation with the applicant, will designate six fields of study and appoint an adviser to guide the student in his work in these fields. As part of this work, the student must complete a minimum of 30 semester hours in graduate courses. Additional course work may be prescribed by the adviser.

When the applicant has satisfied his adviser and the Committee of his readiness to take the General Examination, this Examination will be scheduled.

The General Examination is a written comprehensive on fields of study not limited to the subject matter of courses taken in these fields. Two fields of study are required of all applicants: Economic Theory and Business and Economic History. The four additional fields, selected by the Committee and the applicant, will be drawn from the following list: Marketing, Organization and Management, Business Finance and Investments, Personnel Management, Public Administration, Accounting Theory, Controllership, Money and Banking, Statistics, Transportation and Traffic Management, and such others as the Committee may designate.

Upon successful completion of the General Examination and approval of the subject of the doctoral dissertation, the student may be admitted to candidacy by the Committee on Doctoral Studies. The candidate's research and the preparation of his dissertation are supervised by a Research Adviser designated by the Committee.

The Dissertation

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary and a copy of the abstract for inclusion in the announcement of the examination. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. The summaries of accepted dissertations will be printed in a numbered issue of the University Bulletin. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

The Final Examination

The Final Examination of the candidate consists of his oral defense of the dissertation. The examination will be given by a committee appointed by the Committee

on Doctoral Studies. Upon successful completion of this oral examination the candidate will be approved for the degree of Doctor of Business Administration by the Committee on Doctoral Studies.

SPECIAL PROGRAMS

The Government Management Intern Scholarship Program offers annually fifty scholarships to assist federal agencies in training carefully selected young men and women for administrative leadership in government career service. Each scholarship provides a tuition-free course of 3 hours a semester and appropriate academic credit (up to 6 semester hours) for the successful completion of training assignments required in any agency which has been evaluated by the University.

The Navy Graduate Financial Management Program, sponsored by the Naval Post Graduate School, provides 50 semester hours of work in comptrollership and related fields for a selected group of Naval and Marine officers. The Master's degree is awarded upon successful completion of this full-year program.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields for a selected group of Air Force officers. Most of the officers receive the Master's degree upon successful completion of this full-year program.

The School of Government, Business, and International Affairs cooperates with the College of General Studies in the Off-Campus programs of that College, particularly in the fields of accounting, business administration, controllership, governmental administration, international affairs, and personnel administration. Special Master's degree programs have been established by the College of General Studies in cooperation with the School of Government, Business, and International Affairs for the students and faculty of the Army War College, Carlisle Barracks, Pennsylvania: the War College Air University, Maxwell Air Force Base, Montgomery, Alabama: the Industrial College of the Armed Forces, Fort McNair, Washington, D. C.; and the National War College, Fort McNair, Washington, D. C. These programs lead to the degrees of Master of Arts in International Affairs or Master of Business Administration.

The Department of Business and Public Administration offers work in the field of property and casualty insurance as part of the educationad program of the American Institute for Property and Liability Underwriters, Inc.

CENTER FOR THE BEHAVIORAL SCIENCES

The Center, administratively related to the School of Government, Business, and International Affairs was established as an inter-departmental and inter-disciplinary Center for encouraging behavioral science research, projects and programs, educational and instructional activities, and consulting services to the metropolitan area of Washington, D. C. Projects are sponsored and financed by foundations, governmental agencies, private organizations, and individual gifts. This work is under the direction of Dr. Gordon L. Lippitt, Professor of Behavioral Sciences. A Faculty Executive Committee gives University supervision, while a nation-wide Advisory Board provides policy recommendations for long-range planning. An inter-University Research Advisory Committee reviews proposals and projects. Faculty members and students participate in the activities of the Center for the Behavioral Sciences. Results of research studies and relative projects are reported through a publication program of the Center.

THE COLLEGE OF GENERAL STUDIES*

G. L. Angel, *Dean;* R. W. Eller, *Assistant Dean;* J. G. Brown, *Director, Off-Campus Division;* R. C. Burns, *Director, Institutes and Special Programs;* Mary Coleman, *Director, Reading Clinic;* C. E. Galbreath, *Director, Off-Campus Center, Army War College, Carlisle Barracks, Pa.;* R. S. Jordan, *Director, Off-Campus Center, War College, Air University, Maxwell Air Force Base, Montgomery, Ala.*

STAFF OF INSTRUCTION

September 1960–August 1961

Professors G. L. Angel, J. W. Brewer, D. S. Brown, Elizabeth Burtner, J. H. Coberly, J. C. Dockeray, Mitchell Dreese, R. B. Eastin, R. F. Ericson, D. C. Faith, C. E. Galbreath, C. E. Gauss, F. H. Gibbs, G. F. Henigan, Jr., C. A. M. Hogben, G. C. Jacobus, F. E. Johnston, D. C. Kline, W. H. Kraus, C. A. LaBue, Edwin Lewis, G. L. Lippitt, G. E. McSpadden, Florence Mears, B. S. Root, W. L. Tayler, F. S. Tupper

Professorial Lecturers F. A. Andrews, W. H. Beatty, E. W. Boehmler, R. G. Brown, G. B. Carson, Jr., C. W. Clewlow, Kathryn Cook, G. C. Dildine, W. W. Edwards, Grose Evans, Eric Fischer, J. R. Fredland, W. J. Garvin, Irving Gray, H. F. Hubbard, C. M. Keene, J. L. Krieger, Robert Land, Sar Levitan, Edward McCrensky, M. T. Price, J. C. Stephens, H. E. Thomas, Arthur Uscher, C. N. Weems, Daniel Wit

Associate Professors J. G. Allee, Jr., Lee Bielski, John Clayton, Mary Coleman, W. C. Davis, H. G. Detwiler, Eva Johnson, R. S. Jordan, F. C. Kurtz, H. R. Ludden, G. E. Mazzeo, W. A. McCauley, Muriel McClanahan, C. Y. Meade, J. N. Mosél, Leonard Prestwich, Carol St. Cyr, R. H. Schlagel, J. W. Skinner, Waldo Sommers, C. E. Tuthill

Associate Professorial Lecturers W. E. Baker, C. L. Berg, R. H. Brown, P. E. Brownbach, W. D. Butts, E. W. Cole, Jr., J. G. Coleman, Beverly Crump, R. G. Cutler, O. C. Disler, P. C. Dunleavy, A. S. Glickman, C. E. Goode, W. G. Held, Gladys Jenkins, Dimitrios Kousoulas, Olen Kraus, J. C. Lang, J. A. Morrow, B. H. Patterson, Jr., R. H. Pennington, W. R. Perl, Richard Powers, J. R. Probert, John Provan, Martha Rashid, R. J. Richards, L. R. Schweizer, G. P. Sheya, K. M. Sowers, William Spencer, E. A. Turpin, J. H. White, J. W. Wilson, C. P. Wolle, W. H. Wroten, Jr.

Assistant Professors R. E. Baker, J. T. Davis, R. W. Eller, R. E. Gajdusek, Carlos Lozano, J. L. Metivier, Jr., E. E. Pontius, G. A. Santangelo, Nancy Tischler

Lecturers J. R. Ahern, R. J. Alexander, W. E. Amos, J. K. Ash, L. J. Ashley, J. E. Barber, J. A. Barnet, Jr., J. J. Bean, E. A. Bonner, J. F. Brandenburg, Sonia Brenner, C. J. Brinkman, Isabel Burger, Leon Burnham, W. F. Campbell, S. F. Carter, Natalie Clarkson, E. A. Cogan, R. L. Cohen, H. J. Connery, C. E. Crooke, Sarah Dale, G. L. Darrin, J. L. Diehl, J. F. Doubleday, D. E. Eggleston, E. G. Eigel, Jr., Seneca Eldredge, W. J. Elsen, S. A. Fine, D. S. Fletcher, M. S. Giedemann, David Gold, W. M. Goldenzweig, Sidney Goldstein, A. F. Greenwald, H. L. Grigsby, J. R. Hayes, W. J. Hetzler, J. P. Hummon, Elsie Hurley, J. S. Hurley, Karl Itkin, A. W. Jackowski, J. L. Jackson, W. J. Jacoby, D. H. Janz, W. O. Jewell, W. L. Jobanek, W. A. Kemper, A. H. Kerr, Jr., A. D. Kirsch, Claudio Krieghoff, A. R. Laney, P.

* This listing of Administrative Officers is for 1961–62.

W. Leach, Joseph Lima, E. M. Logan, Margot Louria, R. A. Lucas, R. M. Mason, A. R. McKelvie, C. R. McNutt, G. C. Meyer, James Milano, Sidney Mintz, J. E. Mock, W. B. Newton, Jr., J. F. O'Connell, D. E. Oppert, Morgan Organt, N. E. Paradise, C. A. Pearse, Theodore Polydoroff, D. H. Pritchard, Robert Raful F. V. Reed, A. L. Riggs, R. M. Roth, H. H. Saunders, Wolfgang Schwartz, R. E. Sears, K. A. Shutts, H. F. Sieber, Jr., M. J. Slonim, H. L. Smock, P. F. Stebe, E. W. Steele, C. J. Stringer, Jr., F. J. Sullivan, R. H. Tanck, L. C. Taynton, A. E. Tiemann, T. C. Trippe, Jr., J. W. Tyler, George Ureke, G. E. Vibrans, R. M. Ward, J. R. Wason, W. K. Watson, R. B. Westbrook, G. B. Wilmot, W. P. Young, J. F. Zawacki

Special Lecturers in the College of General Studies M. J. Brown, H. J. Civiello, Helen Cooper, C. F. Dinwiddie, G. M. Ferris, Jr., J. D. Keyes, C. H. McCall, C. A. Murphy, W. S. Myers, Jr., Barbara Nolen, J. R. Reed, B. B. Sibert, Jr., D. A. Wade, L. E. White

Associates N. A. Adams, D. C. Allard, Jr., E. N. Allen, T. L. Austin, Julian Bartolini, S. A. Batrawi, K. J. Bauer, Evelyn Baumann, W. F. V. Bennett, J. A. Bentley, Eva Blackburn, J. G. Boswell, C. E. Brett, Dorothy Brewer, Sandra Brotman, J. N. Chapman, Stephen Chreptak, W. I. Cikins, Harrison Clark, A. B. DePasquale, W. P. DeWitt, W. E. Elrod, Jr., S. I. Euzent, S. J. Fanning, H. W. Forbes, Sidney Friedman, W. D. Gerhard, J. L. Gibney, Jr., Woodrow Harrison, J. V. Harvester, J. F. Hayes, Alois Herrmann, E. K. Hertzler, D. E. Hutter, K. E. Joye, R. L. Kagerer, Harry Kaplan, J. D. Kazer, Jr., Richard Keshian, R. R. Kierce, W. R. Kotapish, P. W. Kyriazis, Marcel Lind, Lottie Lisle, D. R. Lycan, A. T. Mace, W. C. Mathews, F. W. Mathewson, G. O. McClary, Mable McGrath, R. W. Mendenhall, J. B. Miller, Sam Morgenstein, Chester Myslicki, Virgil Ney, J. W. Novak, Charles Ogden, J. S. Orlick, R. R. Potter, A. J. Potts, Virginia Purdy, R. J. Richards, Jr., R. S. Ripley, A. G. Rose III, Vincent Rotundo, Alfonso Sapia-Bosch, Sally Shames, T. A. Stanhope, R. B. Stevens, Jackwell Susman, J. T. Suter, W. J. Tennant, J. A. Timour, Paul Wakefield, R. H. Walther, Renee Weisz, Burton Wright, G. G. Ziegler

COMMITTEES*

The Dean's Council†

1962: D. C. Faith, B. D. Van Evera; 1963: R. H. Moore, C. H. Walther; 1964: A. R. Johnson, B. S. Root

Committee on Undergraduate Admission and Advanced Standing

G. L. Angel *(Chairman)*, R. J. Alexander, J. C. Dockeray, J. W. Harkness, L. P. Leggette, J. L. Metivier, Jr., J. Y. Ruth *(ex officio)*

Committee on Graduate Studies

G. L. Angel *(Chairman)*, J. W. Brewer, J. C. Dockeray, J. L. Jessup, A. R. Johnson, Waldo Sommers, J. Y. Ruth *(ex officio)*

Committee on Scholarship

R. W. Eller *(Chairman)*, H. G. Detwiler, R. B. Eastin, Florence Mears, F. R. Houser *(ex officio)*

* The Dean and Assistant Dean are members ex officio of all committees.
† The Dean of Faculties, the Dean and Assistant Dean of the College are members ex officio of the Council.

Committee on Curriculum and Programs

B. D. Van Evera *(Chairman)*, J. H. Coberly, R. W. Stephens

GENERAL INFORMATION

The College of General Studies was established in 1950. The objectives of the College are to extend the adult education facilities of the University; to introduce experimental procedures in conducting programs of study for mature students; and to provide auxiliary courses not included in formal programs of study, in response to community interest. The college includes the Off-Campus Division, the Campus Division, and the Division of Community Services.

OFF-CAMPUS DIVISION

The Off-Campus Division works closely with personnel administrators, training officers, school officials, and others interested in developing programs of in-service training or off-duty education for employees in departments of the Federal Government, business, and industry; for people working in the fields of education; and for service personnel in nearby military installations. Credit and noncredit courses are organized in any liberal arts field in which there is sufficient demand and for which instructional facilities can be made available. These courses meet at the time and place most convenient for the students enrolled and may begin at any time of the year. In cooperation with Channel 9, WTOP-TV, credit and noncredit television courses and noncredit radio courses are offered.

Credit courses may be applied toward a degree in any college or school of the University provided (1) the student is accepted for degree candidacy in that school or college; (2) the courses meet the curriculum requirements of the school or college; and (3) the number of semester hours earned in the College of General Studies does not exceed the maximum allowed in transfer by the school or college concerned. Credit courses may be transferred to other colleges and universities.

Admission to Course Work

Admission to an off-campus course does not constitute admission to degree candidacy or permission to attend classes on campus.

A simplified procedure for admission and registration in off-campus courses is conducted at or prior to the first meeting of the class. Transcripts of previous academic work are not required. Registration in credit courses is restricted to those whose qualifications indicate that they are able to complete the course successfully. Degree students enrolled in any other college, school, or division of the University may take credit courses in the College of General Studies *only by permission of the dean* of the college, school, or division concerned. In general, off-campus noncredit courses are open to any individual interested in enrolling. However, when a course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. A limit on the size of classes may have to be imposed in order to maintain the quality of instruction.

Admission to Degree Candidacy

Application for degree candidacy should be made only if there is a reasonable assurance that the student will be in the area long enough to complete the requirements. Credits granted by this College for the General Educational Development tests

and for service schools and correspondence courses may or may not be accepted by another institution or by other schools and colleges of this University.

The following factors are considered in determining the eligibility of an applicant:

1. The adequacy of previous academic work as preparation for the course of study contemplated, including quantity and quality of work and the standing of the institution in which it was done.
2. Results of specified tests, when prescribed by the Committee on Undergraduate Admission and Advanced Standing.
3. The aptitude of the student for the curriculum contemplated.
4. The character of the student.

In agencies and service installations where there is sufficient enrollment to permit offering the necessary range of courses, it is possible, without campus study, to earn the following degrees: Associate in Arts, Associate in Science, Associate in Secretarial Administration, Bachelor of Arts, Bachelor of Science in Cartography, and Master of Arts in the fields of Controllership, Governmental Administration, and Personnel Management.

Special Master's degree programs have been established by the College of General Studies in cooperation with the School of Government, Business, and International Affairs for the students and faculty of the Army War College, Carlisle Barracks, Carlisle, Pennsylvania; the Industrial College of the Armed Forces, Fort McNair, Washington, D. C.; the National War College, Fort McNair, Washington, D. C.; and the War College, Air University, Maxwell Air Force Base, Montgomery, Alabama. These programs lead to the degrees of Master of Arts in International Affairs and Master of Business Administration.

CAMPUS DIVISION

The Campus Division is designed for promising adults with unusual backgrounds who merit the individual consideration made possible by this Division's experimental approach to admission, advanced standing, curricula, and evaluation of achievement. The criteria of eligibility for admission are stringent in order to limit registration to (1) adults well qualified to undertake college work but lacking certain academic requirements for admission to other degree-granting schools and colleges of the University and (2) adults who, through work experience, have gained broad knowledge and high competency in some area of learning. This knowledge may be validated by special examination to gain advanced standing toward a degree.

Requirements for Admission

The applicant must meet the following requirements:

1. He must be an adult who has achieved outstanding success in his vocation.
2. He must have completed, with the grade of at least $C+$, 12 semester hours in the Off-Campus Division, the Division of University Students, or the Division of Special Students. The student who has completed a substantial amount of college work elsewhere with excellent grades may apply for admission to degree candidacy after 6 semester hours at The George Washington University.
3. He must present valid reasons for selecting degree candidacy in the Campus Division of the College of General Studies rather than in another school or college of the University.
4. He must enroll for at least two courses a semester on Campus. Full-time study is encouraged.

Degrees

The Campus Division offers programs leading to the degrees of Associate in Arts and Bachelor of Arts. In cooperation with Columbian College of Arts and Sciences; the School of Education; and the School of Government, Business, and International Affairs; the Campus Division makes available programs leading to the degree of Bachelor of Arts, with majors in the liberal arts and sciences, and in various subject-matter fields in education and government. Students selecting these majors must satisfy the prerequisite course requirements prior to admission to candidacy or take them as additional work after being admitted.

Armed Forces Section

The Armed Forces Section of the Campus Division was established for those service personnel who wish to study full time at the University and who have only a limited time under military orders in which to complete their programs of study. Such students register for campus courses through the College of General Studies and remain under its administrative and academic control. By permission of the Dean they may enroll in appropriate courses in the Off-Campus Division.

Military and naval personnel are eligible for admission to this section of the Campus Division if they meet the following requirements:

1. The applicant must be in attendance under official orders which give him a specified time to finish his degree requirements.
2. He must prove that the degree requirements can be completed in the time specified in his orders only by taking advantage of the advanced standing provisions of this College.
3. He must be in a position to enroll for full-time study.

By special arrangements with the Department of the Navy, a naval section of the Armed Forces Section has been established. Such personnel attend the University as full-time students, ordinarily for five semesters.

Provisions for Special Programs

The Air Force Advanced Management Program sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields through the educational facilities of the School of Government, Business, and International Affairs for a selected group of Air Force officers. Those who qualify by a combination of academic background and the satisfactory completion of this program can be awarded a Bachelor's degree by the College of General Studies. Those with Bachelor's degrees can take these courses for graduate credit to be applied toward the degree of Master of Arts in the field of Governmental Administration.

Alumni of the Army War College; the Industrial College of the Armed Forces; the National War College; and the War College, Air University who were unable to complete the requirements for the degrees of Master of Arts in International Affairs and Master of Business Administration while stationed at these military installations may enroll in the Armed Forces Section to complete the requirements for these degrees.

Regulations

Students in the Campus Division of the College of General Studies are subject to and are expected to familiarize themselves with the regulations of the University

stated on pages 8–23 and 39–45, as modified in the separate catalogue of the College of General Studies.

DIVISION OF COMMUNITY SERVICES

This Division was organized to provide needed auxiliary educational services and to promote programs designed to supplement the formal educational offerings of the University.

Noncredit courses in a wide variety of subject fields are set up at the request of any interested group. There are no entrance requirements. The length of each course is determined by the wishes of the sponsoring group and the nature of the subject to be studied.

The George Washington University Reading Clinic offers both diagnostic and corrective work for small groups or individuals and reading improvement techniques for small classes. All courses are designed to meet particular individual needs whether on a remedial basis or for accelerated reading comprehension. (See pages 156–57.)

FEES

The tuition fees for off-campus credit courses and campus courses are stated in the College of General Studies separate catalogue. The tuition fees for noncredit courses are determined by the length and nature of the course.

Fees for noncredit courses and eight-week credit courses are payable in full at the first meeting of the course. By special arrangement, payment for fifteen-week credit courses may be made in three equal installments.

For complete information concerning the College of General Studies, see the separate catalogue which is available upon request to the College of General Studies, 706 Twentieth Street NW.

THE DIVISION OF UNIVERSITY STUDENTS*

E. L. Kayser, *Dean;* J. G. Allee, Jr., *Associate Dean*

THE DEAN'S COUNCIL†

I. B. Hansen, F. E. Johnston, R. D. Kennedy

GENERAL INFORMATION

INTRODUCTORY

The Division of University Students was established in 1930. In this Division are registered mature students who wish to undertake university courses for credit either here or elsewhere or as auditors, but who are not at this time working toward degrees in this University.

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* This listing of Administrative Officers is for 1961–62.

† The Dean of Faculties, the Dean and the Associate Dean of the Division are members ex officio of the Council.

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES *are stated on pages 8–23; other University regulations, on pages 39–45.*

PROBATION

A student must maintain a quality-point index of at least 2.00, or be placed on probation. He remains on probation as long as his index is below 2.00.

SUSPENSION

A student whose index falls below 1.50 is subject to suspension.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. A student suspended twice for poor scholarship will not be readmitted.

TRANSFER TO REGULAR STATUS

A "University student" may be transferred, at his request, to another college or school of the University only upon complying with the regulations of the specific college or school to which he wishes to transfer. The student should familiarize himself with the regulations printed in the University CATALOGUE concerning admission, residence, amount and quality of work. He should also specifically note the University regulations regarding transfers within the University on page 41, and regarding graduation requirements on pages 42–43, and observe that when a student transfers into a degree-granting school or college, to be eligible for a degree he must meet not only all the general graduation requirements, but also such special requirements as may apply in his particular curriculum.

THE DIVISION OF SPECIAL STUDENTS

W. R. West, *Dean**

THE DEAN'S COUNCIL†

Thelma Hunt, A. C. Murdaugh, F. S. Tupper

GENERAL INFORMATION

INTRODUCTORY

The Division of Special Students was organized in 1944. To this Division may be admitted students who are in the process of qualifying for degree candidacy. Students in this Division are designated "special students".

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES *are stated on pages 8–23; other University regulations, on pages 39–45.*

SCHOLARSHIP

A student in this Division may be dropped for reasons of scholarship if his quality-point index falls below 2.00.

* For the academic year 1961–62.
† The Dean of Faculties and the Dean of the Division are members ex officio of the Council.

The system of grading and computing scholarship is described in detail on pages 39 and 40.

Academic Schedule

The schedule of the "special student" is made up of courses required in the curriculum to which he wishes to transfer. The choice of courses must be approved by the Dean. If the student has not completed the language requirements of this curriculum at the time of his admission to the University, he must include three hours of language in each twelve hours of work until this requirement is met. Second- or third-group courses may not be taken unless all first-group requirements have been met or are being met concurrently.

Credits earned at other institutions are evaluated at the time of admission to this Division. They are withheld until the "special student" transfers to a degree-granting college or school, when those appropriate to his curriculum are applied toward advanced standing.

In each individual case, the schedule will be reduced when it is deemed advisable.

Transfer to Regular Status

A "special student" may transfer to a degree-granting college or school of the University when he has satisfactorily completed his program in the Division of Special Students and has met the admission requirements of the college or school to which he wishes to transfer. The student should familiarize himself with regulations printed in the University Catalogue concerning admission, residence, and amount and quality of work. He should also specifically note the University regulations regarding transfer within the University on page 41 and regarding graduation requirements on pages 42–43, and observe that when a student transfers into a degree-granting school or college, to be eligible for a degree he must meet not only all the general graduation requirements, but also such special requirements as may apply in his particular curriculum.

Advisory System

Students in the Division of Special Students are expected to consult with an adviser in the Office of the Dean at least once each semester. Any student who has a question in regard to his status, or whose grades are below *C*, or who is in academic difficulty, is urged to make an appointment promptly without waiting for a request from the Dean.

DIVISION OF AIR SCIENCE

E. M. Wall, *Director*

Military Service Delay and Air Force ROTC Advanced Course Selection Board*

J. L. Gagnier *(Chairman)*, G. M. Koehl, C. D. Linton, M. A. Mason, L. M. Garrell *(Recorder)*

* The President of the University, the Dean of Faculties, and the Director of the Division are members ex officio of this Board.
Selection Board is for the academic year 1961–62.

GENERAL INFORMATION

INTRODUCTORY

The Air Force Reserve Officers Training Corps (Air Force ROTC) unit was established at the University in 1951 under authority of Section 40–47C, National Defense Act of June 3, 1916, as amended. Air Force personnel, approved by the President of the University, are assigned by the Department of the Air Force to supervise and conduct the Air Force ROTC program.

The mission of the Air Force ROTC is to develop in selected students through classroom instruction and leadership training, the qualities essential for advancement to responsible positions as commissioned officers in the United States Air Force.

Course of Study

The program is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

Since many of the academic subjects in which college students are enrolled have a direct relationship to military as well as to civilian careers, some of the liberal arts courses of the University have been substituted for academic courses included in standard Air Force ROTC curricula. Courses have been carefully selected to avoid duplication in instruction and to provide practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral or written expression, and the techniques of problem solving are emphasized throughout the course, both in theory and practice. In addition, orientation flights and field trips to Air Force bases are available to cadets on a voluntary basis.

Twelve semester hours of elective credit* are granted Air Science students as follows:

Freshman year: fall semester, 1 hour; spring semester, 3 hours
Sophomore year: fall semester, 3 hours; spring semester, 1 hour
Junior and senior years: each semester, 1 hour

In the four-year program 16 semester hours of credit for courses offered by other colleges and schools of the University may be substituted for Air Science courses. For a description of Air Science courses, see the Department of Air Science under "Courses of Instruction."

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately $500, which is exempt from income tax. During the period of summer training, cadets receive $75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet.

Eligibility Requirements

Enrollment in the Division of Air Science basic course is open to all men students who are at least 14 years of age, physically fit, of good character, and candidates for a Bachelor's degree. Men enrolling in the basic course are required to complete successfully the two-year course as a prerequisite to graduation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

* The amount of elective credit applicable toward a degree varies with the curriculum concerned.

Women students may enroll in the Basic Leadership Laboratory course, which satisfies the physical education requirement. They may also enroll in the academic portion of the basic course for elective credit, with the approval of the Director of Air Science and the dean concerned.

A cadet enrolled in the advanced course must successfully complete the junior- and senior-year Air Science curricula and summer training unit as a prerequisite to graduation. Upon graduation he is obligated to accept a commission in the United States Air Force, if tendered. Any cadet who for academic, physical, or other reasons becomes disqualified for a commission is relieved of this obligation. Cadets preparing for pilot training may be required to take 35 hours of flying instruction. This instruction is provided by a Civil Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

Both men and women may enroll in Advanced Air Science courses with the approval of the Director of Air Science and the dean concerned.

Military Service Delay

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas. Normally, a cadet is not considered for draft deferment until he has completed one semester's work in the University, with a quality-point index of at least 2.00. A cadet's deferment is subject to withdrawal if his index falls below 2.00.

Student Honorary Military Societies

The Arnold Air Society.—A national honorary military society of qualified Air Force ROTC cadets established to further the mission, traditions, and concept of the United States Air Force as a means of national defense, to promote American citizenship, and to create a close and more rewarding relationship among the Air Force ROTC cadets. The national organization founded in 1947, was named in honor of the late General of the Air Force Henry Harley Arnold. The local squadron established in 1952, was named in honor of General Carl Spaatz (retired), the first Chief of Staff of the United States Air Force. All Air Force ROTC cadets who meet the established qualifications are eligible for election to membership. Members are authorized to wear a blue and gold auguilette and ribbon on their cadet uniforms.

Pershing Rifles.—A national honorary military society founded in 1894 by Lieutenant (later General of the Armies) John Joseph Pershing. Its purpose is to encourage, preserve, and develop the highest ideals of the military profession, promote American citizenship, create a closer and more efficient relationship, and provide appropriate recognition of a high degree of cadet achievement. Only basic ROTC cadets are eligible for election to membership. Members are authorized to wear a blue and silver cord and ribbon on their cadet uniforms.

Women's Activities

Flying Sponsors.—A local women's honorary organization established in 1952 to sponsor Air Force ROTC activities.

Angel Flight.—For women who wish to participate with the men in the Leadership Laboratory. Attractive uniforms are supplied free of charge.

REGULATIONS

Cadets and students in the Division of Air Science are subject to and are expected to familiarize themselves with the University regulations stated on pages 8–23 and

39–45; the regulations of the college, school, or division in which enrolled; and the regulations of the United States Air Force pertaining to Air Force ROTC cadets. Individual copies of Cadet Regulations are issued upon enrollment.

THE SUMMER SESSIONS

C. W. Cole, *Dean**

THE DEAN'S COUNCIL†

C. D. Benson, W. G. Clubb, R. H. Davison, D. C. Kline, C. R. Naeser, R. S. Root

During the summer of 1962, courses are offered from the curricula of the Columbian College of Arts and Sciences; the School of Pharmacy; and the School of Government, Business, and International Affairs during eight weeks of the regular Summer Sessions. Courses from the curricula of the Law School are offered in two six-week terms. The courses from the School of Education are offered as follows: (1) a twelve-week session composed of three-week daytime courses and six-week evening courses, (2) a nine-week session composed of three blocks of three-week daytime courses, and (3) a six-week daytime and evening session.

For a complete statement concerning summer-term work, see the Summer Sessions catalogue.

Administrative Units

HEALTH ADMINISTRATION‡

University Physicians R. B. Castell *(Director)*, H. L. Pugh; *University Surgeon* B. F. Dean, Jr.; *Associate University Physicians* Alfred Brigulio, Margaret Callan, R. A. Cox *(Eye)*, R. F. Dyer, R. H. Harmon, H. O. House *(Nose and Throat)*; *Associate University Surgeon* J. B. Harrell; *Nurse* Mary Dugan

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary schools§; (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.‖ All additional hospital charges for operating room, laboratory, an-

* For the academic year 1961–62.
† The Dean of Faculties and the Dean of the Summer Sessions are members ex officio of the Dean's Council.
‡ The listing of Administrative Officers is for 1961–62.
§ A charge for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.
‖ See Rule (5) for exception.

esthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer sessions and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

VETERANS EDUCATION

D. C. Faith, *Director*[*]

The George Washington University is approved to provide training for those who are eligible under the provisions of Public Laws 634, 190, 550, 16 and 894. The Office of Veterans Education, Building Q, 2029 H Street, NW., operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office concerning the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D.C.

Public Law 634

(War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

Public Law 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6,

[*] For the academic year 1961–62.

1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

Public Law 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

Public Laws 16 and 894

(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

Service School Credits

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates in the Columbian College of Arts and Sciences; the School of Engineering; and the School of Government, Business, and International Affairs. Veterans should submit to the Director of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the Guide to Evaluation of Educational Experience in the Armed Forces.

COMMUNITY AND UNIVERSITY SERVICES

THE READING CLINIC

Mary Coleman, *Director*

The Reading Clinic, 2018 Eye Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition special reading improvement classes are conducted on the high school and adult level.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups

with common reading difficulties, $3.25 a lesson. All fees are payable in advance at the Office of the Cashier.

THE SPEECH CLINIC

C. W. Pettit, *Director*

The Speech Clinic, Lisner Auditorium, 730 Twenty-first Street NW., offers diagnostic and corrective work for children and adults with such speech difficulties as stuttering, lisping, cleft palate, cerebral palsy, asphasia, foreign accent, voice, and articulatory problems.

Fees.—There is no charge for the diagnosis. The fee for individual instruction is $7 an hour; for group instruction, $1 an hour. Fees are payable at the Office of the Cashier.

THE TESTING AND COUNSELING CENTER

Helen Stone, *Acting Director*

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

The Center provides special testing services including: diagnostic tests prescribed by the School of Engineering, admissions tests for the University and for other educational institutions, and tests for business and industry.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is $7.50; for students currently enrolled in the University but not as degree candidates, the fee is $30; for graduates of the University, $30; for community clients, $45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

Student Life

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains seven residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Rooms are leased for the academic year, and a deposit of $50, which is credited toward the fall semester room charge, is required. If notice of withdrawal or cancellation of room reservation is received prior to June 30, $25 of the deposit will be refunded. Room rentals are payable in advance by the semester.

Forms for applications, together with detailed information, may be obtained from

the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the residence halls only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to live outside the residence halls except with persons approved by the Director of Activities for Women.

Freshman girls may live outside the residence halls only with their parents or with immediate relatives with the written approval of their parents.

John Quincy Adams Residence Hall for men provides triple rooms with bath. Rooms rent at $345 a person for the academic year.

John C. Calhoun Residence Hall for men provides double rooms at $380 a person for the academic year.

William H. Crawford Residence Hall for women provides double rooms at $405 a person for the academic year.

Hancock Residence Hall for women provides single rooms at $535 and double rooms at $405 a person for the academic year.

Dolly Madison Residence Hall for women provides double rooms at $405 a person for the academic year.

Hattie M. Strong Residence Hall for women provides single rooms at $470 and double rooms at $405 a person for the academic year.

Welling Residence Hall for men provides a limited number of double rooms at $300 a person for the academic year.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

HEALTH SERVICES

For details, see "Health Administration", pages 154–55.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the religious organizations of their choice. These various denominational groups form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

University Chapel

The University Chapel is a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling on personal problems.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers outstanding employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting officers. (The services of the Counseling Center (see page 157) are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

INTERNATIONAL HOUSE

International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

STUDENT ACTIVITIES

Directors of Student Activities

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all nonacademic phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

Student Government

Student Council

The University believes in encouraging the development of a sense of civic responsibility in its students by delegating to them such authority in student activities as is consistent with established policy and regulations. To this end, the organization of the University includes the Student Council, which, under the guidance of the Direc-

tors of Student Activities, is responsible for the conduct of all student activities. The Student Council is elected annually by the student body.

Committee on Student Life

The Committee on Student Life has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee. This Committee is given authority to approve or disapprove the establishment of any proposed organization on campus.

Eligibility for Student Activities

Any student registered in the University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee, Adams Hall Council, Calhoun Hall Council, Crawford Hall Council, Hancock Hall Council, Madison Hall Council, Strong Hall Council, Welling Hall Council, or any publications staff.
2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

The control and administration of all student activities are outlined in a separate bulletin called "Rules and Regulations Governing Student Activities."

Sports

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Intersorority Athletic Board cooperate with the department of Physical Education in conducting the women's intramural and informal extra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

Other sports activities are included in the Sailing Association and the Rowing Club.

Arts

Students may participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III (Modern Dance) and Folk Dance; Enosinian Debate Society; University Players; University Glee Club; and University Orchestra. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

Annual Events

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion in Life Week.—Observed during the week of Thanksgiving, Religion in Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion in Life Week is sponsored by the University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree, the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions explore annually with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members. Student Council elections are announced.

The Colonial Cruise.—An afternoon and evening cruise on the Potomac in the late spring. Students, alumni, and faculty picnic, dance, and engage in games and athletic contests.

STUDENT ORGANIZATIONS

Honor Societies

Phi Beta Kappa.—A national honor society recognizing "outstanding intellectual capacity well employed" in the field of liberal arts and sciences. Senior and junior students who are candidates for the degree of Bachelor of Arts or Bachelor of Science in Columbian College and who have shown broad cultural interests, distinguished scholarly achievement, high character, general promise, and scholarly ideals may, to a number not exceeding 15 per cent of a class, be elected to membership by the Faculty members of the Alpha Chapter of the District of Columbia.

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Aesculapian Society.—An honorary premedical fraternity.

Alpha Kappa Delta.—A national sociology society.

Alpha Lambda Delta.—A national fraternity established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman women who attain a scholastic average of at least 3.50.

Alpha Omega Alpha.—A national honor medical society.

Alpha Pi Epsilon.—A home economics fraternity.

Arnold Air Society.—A national Air Force ROTC society for advanced cadets.

Delphi.—An intersorority society.

Delta Sigma Rho.—A national forensic society.

Gate and Key.—An intrafraternity society.

Iota Sigma Pi.—A national chemical society for women.

Howard Kane—A.F.A. King Obstetrical Society.—The fifteen students in the third and fourth year classes who maintain the highest grades in their work in obstetrics and gynecology are eligible for membership.

Mortar Board.—A national society for senior college women, stressing leadership, scholarship, and service.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Order of the Coif.—A national legal society, the purpose of which is to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship. Members are elected each year from the highest 10 per cent of the graduating class of the Law School.

Pershing Rifles.—A national Air Force ROTC society for basic cadets.

Phi Epsilon Phi.—A national botany fraternity.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.

Phi Sigma Tau.—A national philosophy honor society.

Pi Delta Epsilon.—A national collegiate journalism fraternity.

Pi Epsilon Delta.—A national drama honorary fraternity.

Pi Gamma Mu.—A national social-science society.

Psi Chi.—A national psychology fraternity.

Rho Chi Society.—A national pharmaceutical society.

Sigma Alpha Eta.—A national speech and hearing fraternity.

Sigma Epsilon.—A local engineering honorary society.

Sigma Pi Sigma.—A national physics fraternity.

Sigma Tau.—A national engineering fraternity, the purpose of which is to recognize scholarship and professional attainment.

Smith-Reed-Russell Society.—A scholastic society in the school of Medicine. Students of the third and fourth years who maintain a scholastic average of 88 per cent are eligible for associate membership.

Tassels.—A service honorary society for sophomore women.

William Beaumont Medical Society.—A society founded with the object of encouraging and stimulating medical students in work of individual investigation.

Professional Organizations

Alpha Chi Sigma (chemistry), Alpha Kappa Psi (commerce and economics), Alpha Zeta Omega (pharmacy), American Institute of Electrical Engineers—Institute of Radio Engineers (student chapter), American Medical Association (student branch), American Medical Women's Association (student branch), American Pharmaceutical Association (student branch), American Society of Civil Engineers (student chapter), American Society of Mechanical Engineers (student chapter), Delta Theta Phi (law), Kappa Beta Pi (law), Kappa Psi (pharmacy), Student National Education Association, Nu Sigma Nu (medicine), Phi Alpha Delta (law), Phi Chi (medicine), Phi Delta Delta (law), Phi Delta Epsilon (medicine), Phi Delta Gamma (graduate), Phi Delta Kappa (education), Phi Delta Phi (law), Pi Lambda Theta (education), Society for the Advancement of Management (student chapter), Theta Tau (engineering).

Social Fraternities

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Sigma Delta, Sigma Nu, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta.

Social Sororities

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi, Sigma Delta Tau.

Departmental Clubs

Case Club, Chemistry Club, El Club Español, Engineers' Council, Enosinian Debating Society, Home Economics Club, Le Cercle Français, Lester F. Ward Sociological Society, Men's Physical Education Club, Pharmacy Council, Phi Sigma Tau (philosophy), Russian Club, Sigma Delta Pi (Spanish), Student Bar Association, Women's Athletic Association.

Religious Organizations

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Medical Society, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

Student Publications

Amicus Curiae (Law School publication), *The Cherry Tree* (the annual), *The University Hatchet* (weekly newspaper), *The George Washington Law Review*, *Mechelecio* (engineers' publication), *The Percolator* (pharmaceutical publication), *The Potomac* (literary magazine), *The Speculum* (medical annual), *The Student Handbook*.

Other Organizations

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Calhoun Hall Council, Cheerleaders, Colonial Boosters, Crawford Hall Council, Cultural Foundation, Democratic Club, Flying Sponsors, Foggy Bottom Sports Car Club, Hancock Hall Council, Interfraternity Council, Interlaw Fraternity Council, International Relations Club, International Students' Society, Inter-sorority Athletic Board, Junior Panhellenic Association, Madison Hall Council, Old Men, Republican Club, Senior Panhellenic Association, Strong Hall Council, Student Council, Students for Better Government (Political Party), Student Legal Aid Society, Station WRGW, University Pep Band, Wandering Greeks, Welling Hall Council, Writers' Club.

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the University in the summer of 1962 and in the academic year 1962–63. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

HOURS OF INSTRUCTION

Classes are scheduled in the morning, afternoon, and evening. Evening and daytime sections of the same course are identical, are taught by the same staff of instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the usual four years, a part-time student may complete the requirements and obtain a degree.

EXPLANATION OF COURSE NUMBERS

In the departments of the School of Medicine, first-year courses are numbered from 101 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and fourth-year courses, from 401 to 500. This includes courses open to both medical and nonmedical students. Courses limited to nonmedical students follow the numbering system used in "all other schools and colleges" (see below).

In the National Law Center, first-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses from 401 to 500.

In all other schools and colleges the following system of numbering is used:

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the instructor, and when the completion of additional work has been certified by the instructor.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the instructor to qualified seniors; they are not open to other undergraduates.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3–3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING*

Professors R. D. Kennedy *(Chairman)*, Edwin Lewis, J. O. Eaton
Professorial Lecturers F. C. Brimacombe, J. L. Buckler, F. V. Demaret, Frank Higginbotham, C. A. McLaughlin, C. L. Simpson, L. W. Hamilton, I. E. Steele
Associate Professor F. C. Kurtz
Associate Professorial Lecturer O. C. Disler
Lecturer E. E. Pontius, Jr.
Instructor M. G. Gallagher

Associate in Arts (Two-year vocational curriculum in Accounting).—For curriculum see page 57.

Bachelor of Business Administration and *Master of Business Administration with a major in Accounting.*—See pages 56, 133–34.

First Group

1–2 *Introductory Accounting* (3–3) Kennedy and Staff

First half: fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. *First half:* basic principles underlying accounting records, preparation of the work sheet and financial statements, accounting for single proprietorships and partnerships. *Second half:* accounting for corporations and introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 *General Accounting* (3) Kennedy and Staff

Not offered 1962–63. Study of accounting systems and accounting for single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

Second Group

101 *Cost Accounting* (3) Eaton

Fall—day and evening; summer 1962. Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; and analysis and interpretation of cost data. Prerequisite: Accounting 1–2.

102 *Advanced Cost Accounting* (3) Eaton

Spring—evening. Advanced cost accounting theory and problems with emphasis on development and analysis of standard costs, the use of cost data for managerial control, and distribution cost accounting. Prerequisite: Accounting 101 or permission of the instructor.

111 *Financial Statement Analysis* (3) Kennedy, Steele

Fall—day; spring—evening; summer 1962. Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1–2 or permission of the instructor.

115 *Survey of Accounting* (3) Disler, Gallagher

Fall—evening; spring—evening; summer 1962. Accounting for single proprietorships and corporations with emphasis on the use of accounting information in the management process; study of theory, terminology, and the analysis and interpretation of accounting data. Not open for credit to Accounting or Business Administration majors.

121–22 *Intermediate Accounting* (3–3) Gallagher, Simpson

Academic year—day and evening. *First half:* valuation and amortization problems of current assets, long term investments, tangible fixed assets, intangible assets, and de-

* The Staff of Instruction here listed is for the academic year 1961–62.

ferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

132 *Accounting Theory* (3) Kennedy

Spring—day. Development of basic accounting principles and concepts with special reference to current thought expressed by the American Institute of Certified Public Accountants and the American Accounting Association. Prerequisite: 6 hours of accounting.

141 *Governmental Accounting* (3) Lewis

Fall—evening. Problems relating to governmental appropriation accounts, encumbrances, and fund accounting. Emphasis on municipal and state government accounting with an introduction to federal accounting. Prerequisite: Accounting 1–2 or permission of the instructor.

144 *Federal Accounting* (3) Lewis

Spring—evening. Accounting procedures in the Federal Government, with emphasis on agency level accounts, implementation of accrued expenditure legislation, and accounting support for cost-based budgets. Accounts of the United States Treasury; current concepts of allotment, obligation, and disbursement accounting and reporting. Prerequisite: Accounting 141 or permission of the instructor.

147 *Federal Budgeting* (3) Lewis

Not offered 1962–63. Budgetary procedures in the Federal Government, with emphasis on agency level budget programming, budget formulation and the techniques for achieving management objectives through the budget process; cost-based budgeting; expenditure programming and accrued expenditure limitations; revenue estimating. Prerequisite: Accounting 144 or extensive experience in federal budgeting.

161 *Income Tax Accounting* (3) Kurtz

Fall—evening. Problems involved in the federal income taxation of individuals and corporations, differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1–2.

162 *Federal Tax Practice* (3) Kurtz

Spring—evening. Advanced problems of federal tax practice such as the tax treatment of partnerships, estates, trusts, corporate reorganizations, foreign income, and gifts; use of the tax services; assessment, collection, and refund procedures. Prerequisite: Accounting 161 or the permission of the instructor.

171 *Auditing* (3) Eaton

Fall—evening; spring—day. Duties and responsibilities of auditors: principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121–22.

172 *Auditing Practice* (3) Eaton

Spring—evening. Preparation of audit reports, accounting statements to be filed with Securities and Exchange Commission, and current developments of auditing standards and practice. Prerequisite: Accounting 171 or permission of the instructor.

181 *Accounting Systems* (3) Lewis

Fall—evening. Theory and procedure of designing and installing accounting systems for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121–22, and 171, or permission of the instructor.

191 *Advanced Accounting* (3) Kurtz, Simpson

Fall—evening; summer 1962. Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121–22.

193 *Business Budgeting* (3) Lewis, Buckler

Fall—day; spring—evening; summer 1962. Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary con-

trol to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1–2.

196 *Accounting Policy and Control* (3) Lewis
Not offered 1962–63. Accounting decision-making and analytical techniques, emphasizing the financial policy and operational role of the accountant and his contribution to enterprise management. Readings, cases, and problems form a basis for class discussions. Prerequisites: Accounting 101, 111, 161, and 171, or permission of the instructor.

198 *Professional Accounting Review* (3) Lewis
Spring—evening. Review and coordination of the principles and techniques developed in the accounting curriculum, in preparation for general practice in the field of accountancy and for professional accounting examinations. Prerequisite: Accounting 101, 141, 162, 171, and 191, or permission of the instructor.

Third Group

211–12 *Managerial Accounting* (3–3) Kennedy, Higginbotham
First half: not offered 1962–63. *Second half:* fall—evening. *First half:* analysis of the accounting system with special reference to the use of financial and operating records and accounting reports as tools of management; a study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1–2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite to Accounting 212: Accounting 211 or permission of the instructor.

215 *Survey of Managerial Accounting* (3) Higginbotham
Spring—evening. Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process. Prerequisite: Accounting 1–2, 3, or 115.

231 *Contemporary Accounting Theory* (3) Kurtz, Higginbotham
Spring—evening; summer 1962. Advanced accounting principles and concepts and recent theories concerned with the valuation and amortization of assets and determination of income. Admission by permission of the instructor.

246 *Governmental Accounting and Budgeting Problems* (3)
Not offered 1962–63. Advanced principles and practices in federal accounting relationship to general policy and administration. Prerequisite: Accounting 144 or permission of the instructor.

275 *Internal Control and Auditing* (3) Kurtz
Summer 1962. Internal accounting controls; review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitableness. Emphasis on the use of internal control and auditing as an aid to management. Prerequisite: Accounting 171 or permission of the instructor.

295–96 *Seminar in Accounting* (3–3) Kennedy
Academic year—evening. Selected accounting research topics and problems; individual oral and written reports. Admission by permission of the instructor.

297–98 *Accounting Reading and Research* (3–3) Kennedy and Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) Kennedy and Staff
Academic year—as arranged; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the accounting courses listed below for students enrolled in the following special programs:

Navy Graduate Financial Management Program, Air Force Advanced Management Program, and Engineering Administration.

3 *General Accounting* (3)

115 *Survey of Accounting* (3)

204 *Survey of Cost Accounting* (2)

211–12 *Managerial Accounting* (3–3)

215 *Survey of Managerial Accounting* (3)

278 *Survey of Internal Control and Auditing* (3)

293 *Budget Preparation and Administration* (3)

AIR SCIENCE*

Professor E. M. Wall *(Chairman)*
Assistant Professors J. L. Gagnier, L. M. Garrell
Instructors Anthony Nassner, C. C. Smarr, C. R. Young

Commission in the United States Air Force Reserve.—Upon being awarded a Bachelor's degree and upon the satisfactory completion of the Air Force ROTC course of instruction prescribed by law and regulations, the graduate will be appointed Second Lieutenant, United States Air Force Reserve.

Basic Course

1–2 *Leadership Laboratory—Freshman Year* (1–1) The Staff
Academic year—day. Cadet basic airman training. Defense orientation, military courtesy, discipline, appearance and bearing; element, flight squadron, and mass formation drill; parades and ceremonies; the military mission and the problem of national security. Minimum 15 hours a semester. Laboratory fee, charged one time a year, $3. (May be substituted for Physical Education 1–2.)

11–12 *Leadership Laboratory—Sophomore Year* (1–1) The Staff
Academic year—day. Cadet noncommissioned officer training. Military bearing and courtesy, all phases of drills and ceremonies, command voice training and command responsibility. Prerequisite: Air Science 1–2, 21–22 for men and Air Science 1–2 for women. Political Science 1 or 9 is recommended as an elective during the sophomore year in preparation for Political Science 171 (see Air Science 151–52). Minimum 15 hours a semester. Laboratory fee, charged one time a year, $3. (May be substituted for Physical Education 11–12.)

21 *Air Science—Freshman Year* (2 or 3)
Fall. Any 2 or 3 semester hour introductory college course in the areas of mathematics, physical and natural sciences, foreign languages, the humanities or social sciences approved by the Division of Air Science as meeting the pre-commission officer educational requirements.

22 *Air Science—Freshman Year* (2) Garrell
Spring: 2 hours a week—day. A general survey of aerospace power designed to provide an understanding of the elements of aerospace power; and an introduction to the mechanics of aerospace vehicles and to the composition of and necessity for na-

* The Staff of Instruction here listed is for the academic year 1961–62.

tional security forces. Instruction includes potentials of aerospace power, air vehicles and principles of flight, the military instrument of national security, and professional opportunities in the United States Air Force.

51 *Air Science—Sophomore Year* (2) Garrell

Fall: 2 hours a week—day. An introduction to aerospace missiles and aircraft and their propulsion systems; aerospace defense; modern targeting and electronic warfare; high explosive, nuclear, chemical, and biological warheads; aerospace strategic and tactical organizations and operations with contemporary Air Force weapon systems. Includes problems, mechanics, and military implications of present and future space operations; contemporary aerospace military thought.

52 *Air Science—Sophomore Year* (2 or 3)

Spring. Any 2 or 3 semester hour introductory college course in the areas of mathematics, physical or natural sciences, foreign languages, the humanities or social sciences approved by the Division of Air Science as meeting the pre-commission officer educational requirements. Political Science 1 or 9 is recommended as an elective during the sophomore year in preparation for Political Science 171 (see Air Science 151–52).

Advanced Course

101–2 *Air Science—Junior Year* (1–1) Gagnier

Academic year—day. Air Force officer development. Knowledge and skills required of a junior officer in the Air Force. This includes the Air Force commander, his staff, and the air base; the military justice system; and preparation for summer training. Prerequisite or concurrent registration: Business Administration 102 and 193, which are not to be taken in the same semester of the academic year.

103–4 *Leadership Laboratory—Junior Year* The Staff

(Credit is a part of Air Science 101–2)

Academic year—day. Cadet noncommissioned officer and officer training. Wearing of the uniform, parades and ceremonies, commands and command voice. Cadets perform duties involving planning for and supervision of Cadet Corps activities. Emphasis placed on leadership and management proficiency. Minimum 15 hours a semester.

105 *Summer Training Unit—Between Junior and Senior Years* (required) The Staff

Attendance at a four-week Air Force ROTC summer training unit at an Air Force base within continental United States is mandatory. Program consists of familiarization flying, physical training, individual weapons, Air Force base activity and equipment, field exercises, air base problems, and leadership training.

151–52 *Air Science—Senior Year* (1–1) Wall

Academic year—day. *First half:* weather and navigation. A study of the weather and navigational aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, and dead reckoning navigation. *Second half:* the Air Force officer. A study of materials to help the cadet make a rapid effective adjustment to active duty as an officer of the United States Air Force. Prerequisite or concurrent registration: Political Science 171 and Geography 146, which are not to be taken in the same semester of the academic year. Only pilot candidates need take weather and navigation. Others may substitute any college course approved by the Division of Air Science.

153–54 *Leadership Laboratory—Senior Year* The Staff

(Credit is a part of Air Science 151–52)

Academic year—day. Cadet officer training. Cadet officers conduct activities of Corps of Cadets through chain of command, instruct subordinates, plan and supervise Cadet Corps training and administration. Preparation for commissioned officer duties. Development of leadership and managerial responsibilities. Minimum 15 hours per semester.

ANATOMY*

Professors I. R. Telford *(Chairman)*, Paul Calabrisi
Professorial Lecturer T. D. Stewart
Associate Professors F. D. Allan, T. N. Johnson
Assistant Professors J. B. Christensen, J. C. Bartone
Clinical Instructors R. N. Brown, L. E. Church, L. C. Dearden

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Special Lecturer B. S. Blumberg

Master of Science in the field of Anatomy.—Prerequisite: a Bachelor of Arts or Bachelor of Science degree from this University, or the equivalent, with a major in Biology, Chemistry, or Zoology. The undergraduate program must include the following courses, or the equivalent: Biology 1-2†, Chemistry 11-12, 21, 151-52; Physics 11, 12; Zoology 103-4 (formerly 41-42). Biochemistry 221-22 is recommended as an elective.

Required: the general requirements, pages 64-66, including Anatomy 203, 204, 205, 221-22, 295-96, 299-300, and graduate courses in biochemistry, physiology, or related fields selected with the approval of the Department. It is not always possible to arrange courses and research so that the student can be assured of completing all the required work in one academic year.

Doctor of Philosophy.—See pages 67-73.

101-2 *Gross Anatomy* — **Calabrisi and Staff**
Academic year: fall—20 hours a week; spring—3 hours a week. Regional dissection of the human body, supplemented with lectures and quiz sections. Study of X ray anatomy to emphasize the functional aspects of the position, shape, and relation of the viscera and skeletal components.

103 *Human Embryology* — **Allan and Staff**
Spring—3 hours a week. The origin and development of the human body. Special emphasis on the value of embryology in interpreting anatomical anomalies and variations as seen in gross dissection, surgery, obstetrics, and pathology.

104 *Neuroanatomy* — **Johnson and Staff**
Fall—5½ hours a week. The macroscopic and microscopic study of the central nervous system and the special sense organs. Emphasis on such dynamic aspects as development, pathways, lesions, etc.

105 *Microscopic Anatomy* — **Telford and Staff**
Fall—9 hours a week. Study of the detailed minute structure of cells, tissues, and organs of the human body, with emphasis on the relation of structure to function. Recognition and interpretation of histological sections tested by practical examinations.

201-2 *Gross Anatomy* (8-2) — **Calabrisi and Staff**
Academic year—as arranged. For qualified nonmedical graduate students. Same as Anatomy 101-2. Anatomy 201—laboratory fee, $21; Anatomy 202—laboratory fee, $16.

203 *Human Embryology* (2) — **Allan and Staff**
Spring—as arranged. For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, $8.

204 *Neuroanatomy* (3) — **Johnson and Staff**
Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, $13.

205 *Microscopic Anatomy* (4) — **Telford and Staff**
Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, $13.

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* The Staff of Instruction here listed is for the academic year 1961-62.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

221–22 *Seminar* (1–1) Telford and Staff
Academic year: 1 hour a week—as arranged. Research reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.

249–50 *Introduction to Medical Research** (3–3) The Staff
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

295–96 *Research* (arr.) The Staff
Academic year—as arranged. Fee to be arranged.

299–300 *Thesis* (3–3) The Staff

ANESTHESIOLOGY†

Professors C. S. Coakley *(Chairman)*, Seymour Alpert
Clinical Professor D. H. Stubbs
Associate Professor C. R. MacCordy
Assistant Professor Paula Kaiser
Assistant Clinical Professors S. N. Albert, Maria Benzinger
Intructors H. E. Curtis, Helene Werner, Patricia Russell, Virginia Porter
Clinical Instructors W. E. Bageant, Allen Widome, Charles Gruenwald

320 *Anesthesiology* The Staff
Spring—1 hour a week. The fundamentals of anesthesia are reviewed and correlated with other medical specialties.

421–22 *Anesthesia Seminar* The Staff
Academic year—1 hour a week. Students attend anesthesia seminars during their surgical clinical clerkships. University Hospital.

433–34 *Advanced Anesthesiology* The Staff
Academic year—as arranged. Students are rotated through the work of the department for a period of two weeks and assigned to work in the operating rooms and to attend conferences and seminars. For the more advanced students a three-week elective is offered.

ART†

Professors D. C. Kline *(Chairman)*, W. A. MacDonald
Associate Professor L. P. Leite
Associate Professorial Lecturer Grace Evans
Assistant Professor George Steiner
Studio Lecturers on the Staff of the Corcoran School of Art Edmund Archer, Richard Lahey, Jessalee Sickman, Heinz Warneke, C. E. Forsythe, Kenneth Hine, Harry Gates, Jack Perlmutter, Alexander Russo

* This is an interdepartmental course. The student should register in the department directing his research.
† The Staff of Instruction here listed is for the academic year 1961–62.

Bachelor of Arts with a major in (1) ***Art History and Theory,*** (2) ***Drawing and Painting,*** (3) ***Sculpture,*** or (4) ***Commercial Art (Departmental):***

The major in Art History and Theory.—Prerequisite: the Arts and Letters curriculum, pages 52–53, or the equivalent, including Art 31–32 and 71–72.

Required: in addition to the general requirements, pages 58–62, eighteen semester hours, as follows: Art 101 or 102, 103, 104 or 105, 110, 112, 113 or 114; and twelve semester hours selected from second-group courses, or from third-group courses open to undergraduates with the approval of the instructor. Students intending to major in this field are urged to acquire a reading knowledge of a foreign language, preferably French or German, at the earliest possible convenience.

The major in Drawing and Painting, Sculpture, or *Commercial Art.*—Prerequisite: the Arts and Letters curriculum, pages 52–53, or the equivalent, including Art 21–22, 41–42, and 31–32 or 71–72.

Required: in addition to the general requirements, pages 58–62, twenty-four semester hours of studio practice; six semester hours of art history selected from second-group courses or from third-group courses open to undergraduates with the approval of the instructor.

Classes in the practice of art are held at the Corcoran School of Art.

Master of Arts in the field of Art History and Criticism with concentrations in Classical Art and Archeology, Art of the Americas, Renaissance and Baroque Art, and Contemporary Art.—Prerequisite: the degree of Bachelor of Arts with a major in Art History and Theory at this University, or the equivalent.

Required: the general requirements, pages 64–66. As much as possible of the twenty-four semester hours in course work should be in third-group courses. A general written examination on the problems in the field of Art History and Criticism; a written thesis embodying the results of research on some specific topic in the history and criticism of art.

Master of Fine Arts in the field of Painting or *of Sculpture.*—Prerequisite: the degree of Bachelor of Arts with a major in Drawing and Painting, Sculpture, or Commercial Art at this University, or the equivalent.

Required: the general requirements, pages 64–66. As much as possible of the twenty-four semester hours in course work should be in third-group courses. A creative thesis in painting or sculpture; a paper discussing some technical phase of the problem illustrated by the thesis.

Bachelor of Arts in Education with a teaching field in Art (School of Education).—Prerequisite: the Education curriculum, pages 54–55.

Required: the Art option and professional courses listed in the School of Education Catalogue.

ART HISTORY AND THEORY

First Group

1 *Art Appreciation* (3) — MacDonald

Fall—day; spring—day; summer 1962. A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and the ideas in art through the ages. (Primarily for nonmajors.)

31–32 *Survey of Western Art* (3–3) — Leite

Academic year—day. A survey of the arts in the Western World from prehistoric to modern times. A foundation for further study in the history of art.

71–72 *Introduction to the Arts in America* (3–3) — Kline

Academic year—evening; summer 1962—Art 71 (3). Painting, sculpture, and architecture of America, with selected references to the crafts and popular arts. *First half:* from Colonial beginnings to the Republican Age. *Second half:* from early 19th century to the present.

101 *Greek and Roman Architecture* (3) — MacDonald

Fall—day.

102 *Greek and Roman Sculpture* (3) — MacDonald

Spring—day.

103 *Medieval Art* (3) (Formerly Art 102) Evans
Fall—day. A study of architecture, sculpture, and painting from the formative states of Christian Art in the Byzantine Age through the Romanesque and Gothic periods.

104 *Renaissance Art in Italy I* (3) Leite
Fall—day. The early developments from the 13th to the 15th century.

105 *Renaissance Art in Italy II* (3) Leite
Spring—day. The High Renaissance and Mannerism.

106 *Renaissance Art in the North* (3) Leite
Summer 1962. A study of the painting in the Netherlands, Germany, France, Spain, and Portugal.

107 *Eighteenth Century Art in Europe* (3) Evans
Spring—day. The development of painting, sculpture, and architecture in 18th century Europe.

109 *Nineteenth Century Art in Europe* (3) Leite
Fall—day. Painting and sculpture from Academism to Symbolism.

110 *Contemporary Art* (3) Leite
Spring—day; summer 1962. Painting and sculpture in 20th century Europe.

111 *Classical Archeology* (3) MacDonald
Not offered 1962–63. A study of archeological monuments of classical civilizations, with intensive study of one or more areas selected from architecture, sculpture, painting, or minor arts.

112 *Art of Egypt and the Ancient Orient* (3) MacDonald
Spring—day. A study of the art of Mesopotamia, Anatolia, Egypt, and Persia.

113 *Baroque Art in Italy* (3) Leite
Fall—day. The development of painting, sculpture, and architecture in the 16th and 17th centuries in Italy.

114 *Baroque Art in the North* (3)
Not offered 1962–63. The development of painting, sculpture, and architecture in the 16th and 17 centuries in Holland, Flanders, Spain, France, Germany, and England.

115 *Christian Iconography* (3) (Formerly Art 210) Leite
Not offered 1962–63. The origins and development of Christian symbols and themes from Early Christian to modern times.

116 *Classical Iconography* (3) (Formerly Art 211) MacDonald
Not offered 1962–63. The origin and development of myths in classical art.

120 *Art of China and Japan* (3) (Formerly Art 204) Kline
Fall—day. The architecture, painting, and sculpture of China, Korea, and Japan.

141 *Interior Decoration* (3) Kline
Fall—day. A study of the principles of decoration dealing with furniture designs and ensemble layout, draperies, color, accessories, and lighting.

142 *House Planning* (3) Kline
Spring—day. Study of the contemporary house for family living, including site problems, the case plan, materials of building, and climate conditioning.

143 *Folk Arts in America* (3) Kline
Not offered 1962–63. Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts; selected references to American folk music.

THIRD GROUP

203 *Primitive Art** (3) Kline
Summer 1962. The arts of prehistoric and primitive man in Europe in the pre-Columbian Americas, Oceania, and Africa.

207 *Modern Architecture* (3) Kline
Spring—day. The development of modern architecture and building technology in Europe and America from the late 19th century to the present.

243 *Seminar in American Art* (3) Kline
Not offered 1962–63.

244 *Seminar in Naturalism and Realism* (3) Leite
Not offered 1962–63. A reading knowledge of French is desirable.

245 *Seminar in Romanticism* (3) Leite
Not offered 1962–63. A reading knowledge of French and German is desirable.

246 *Seminar in Classical Art* (3) MacDonald
Fall—day.

247 *Seminar in Symbolism* (3) Leite
1962–63 and every third year: spring—day.

248 *Studies in Classical Art* (3) MacDonald
Summer 1962.

261–62 *Theory and Criticism* (3–3) (Formerly Art 161–62) MacDonald
Academic year—evening. The history of theory and criticism in Classical, Medieval, Renaissance, and Modern times.

271–72 *Museum Techniques*† (arr.) MacDonald
Academic year—as arranged. Assignments in intern training in museum work. Students may take this course three days a week from 9:00 A.M. to 5:00 P.M. throughout the academic year and earn 3 credits a semester; or they may take it intensively, 5 days a week from 9:00 A.M. to 5:00 P.M., and earn 6 credits in one semester.

289–90 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

DRAWING AND PAINTING, SCULPTURE, AND COMMERCIAL ART

FIRST GROUP

21–22 *Basic Composition and Techniques*‡ (3–3) Forsythe
Academic year—day and evening; summer 1962—Art 21 (3). Study of the fundamentals of two- and three-dimensional composition; an investigation of materials and their application.

41–42 *Drawing and Perspective* (3–3) Russo
Academic year—day and evening; summer 1962—Art 41 (3). An introductory course in object and figure drawing and mechanical perspective.

65–66 *Drawing and Painting I—Life, Still Life, and Portrait* (3–3) The Staff
Academic year—day; summer 1962—Art 65 (3).

81–82 *Sculpture I* (3–3) Warneke
Academic year—day and evening.

* May be taken for undergraduate credit with the approval of the instructor.
† Primarily for candidates for the degree of Master of Arts in the field of Museology and students in the Special Program in Museum Training.
‡ Art 21–21 is prerequisite to all other studio courses.

Second Group

125–26 *Drawing and Painting II—Life, Still Life, and Portrait* (6–6) — Sickman
Academic year—day.

127–28 *Drawing and Painting II—Life and Portrait* (6–6) — Archer
Academic year—day and evening.

135 *Commercial Design* (3) — Hine
Summer 1962. Studies of the principles and applications of graphic design.

157–58 *Print Making* (6–6) — Perlmutter
Academic year—day. Relief printing and wood block, with special reference to western and eastern techniques.

159–60 *Anatomy and Techniques* (6–6) — Russo
Academic year—day. Special problems in anatomy and drawing and painting of the life model in action.

165–66 *Drawing and Painting II—Life and Portrait* (6–6) — Lahey
Academic year—day and evening; summer 1962—Art 165 (3)*.

175–76 *Advanced Composition* (6–6) — Forsythe
Academic year—day and evening; summer 1962—Art 175 (3)*. Advanced problems in creative design and composition; development of representational skills.

179–80 *Sculpture II* (6–6) — Warneke
Academic year—day and evening. Portrait-life modeling and composition in clay, plaster and wood carving.

183–84 *Commercial Art* (6–6) — Hine
Academic year—day and evening. Instruction in fundamental principles: to analyze, visualize, and skillfully express ideas.

185–86 *Advanced Commercial Art* (6–6) — Hine
Academic year—day and evening. Practice in the development of professional techniques for thumb-nail and comprehensive layouts; preparation of professional portfolio.

189–90 *Advanced Sculpture* (6–6) — Warneke
Academic year—day and evening. Advanced problems in modeling and direct carving. (Restricted to students who have completed 18 hours of sculpture).

Third Group

265–66 *Painting III* (6–6) — The Staff
Academic year—day and evening; summer 1962—Art 265 (3)*.

275 *Painting IV* (6) — The Staff
Fall—as arranged; spring—as arranged; summer 1962—Art 275 (3)*.

279–80 *Sculpture III* (6–6) — Warneke
Academic year—as arranged.

281 *Sculpture IV* (6) — Warneke
Fall—as arranged; spring—as arranged.

299–300 *Thesis* (3–3) — The Staff
Academic year—as arranged; summer 1962.

* May be taken for 6 semester hours with the approval of the instructor.

MUSIC

First Group

3–4 *Music Appreciation* (3–3) Steiner
Academic year—day and evening; summer 1962—Music 3 (3). An introduction to the historical sequences of musical style, the elements of music principle and musical forms, the works of the chief composers, and the study of instruments and other media of musical presentation.

5–6 *Fundamentals of Music* (3–3) Steiner
Academic year—evening. Elements of music—basic concepts of pitch, rhythm, scales, intervals and chords, notation and terms.

51–52 *Orchestra* (1–1) Steiner
Academic year—evening. Preparation and performance of orchestral literature. Prerequisite: audition before Director.

Second Group

103–4 *History of Music* (3–3) _____
Academic year—day; summer 1962—Art 103 (3). The development of music in the Western World from the Early Christian era to the 20th century.

131–32 *Harmony* (3–3) _____
Academic year—evening. Chord structure, inversions, modulations, figured and unfigured bass. Practice in elementary harmonic writing.

Related Course in Another Department

Classical Languages and Literatures 71–72 *Greek and Roman Backgrounds in Literature* (3–3)

BIOCHEMISTRY*

Professors J. H. Roe *(Emeritus)*, C. R. Treadwell *(Chairman)*
Professorial Lecturers W. R. Carroll, Irving Gray, Arthur Weissbach
Associate Professor B. W. Smith
Associate Professorial Lecturer Leon Swell
Assistant Professors G. V. Vahouny, J. M. Bailey
Associate H. W. Clark, Jr.

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Special Lecturer Sidney Udenfriend

Master of Arts or *Master of Science in the field of Biochemistry.*—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree. The undergraduate program must have included the following courses, or the equivalent: Biology 1–2†; Chemistry 11–12, 21, 22, 151–52; Physics 11 and 12.

Required: the general requirements, pages 64–66, including Biochemistry 221–22, 225–26, 227–28, 299–300. The remaining courses are to be selected from Biochemistry 224, 232, 241, 251, 261, 295–96, or, with the approval of the adviser, from graduate courses in Microbiology, Chemistry, Physiology, or Pharmacology. It is usually not possible to arrange courses and research so that the student can be assured of completing all of the required work in one academic year.

Doctor of Philosophy.—See pages 67–73.

* The Staff of Instruction here listed is for the academic year 1961–62.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

113–14 ***Medical Biochemistry*** — The Staff
Academic year: lecture (2 hours), conference (1 hour), laboratory (6 hours)—as arranged. Physiological and clinical chemistry. For medical students.

221–22 ***General Biochemistry*** (4–4) — Vahouny
Academic year—Tues. and Thurs., 8:00 to 12:00 A.M. A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 152. Material fee, $15 a semester.

224 ***Biochemistry of the Enzymes*** (1) — Weissbach
Spring—Mon., 5:00 P.M. Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.

225–26 ***Biochemical Procedures*** (3–3) — Smith and Staff
Academic year—as arranged. A laboratory course. Material fee, $16 a semester.

227–28 ***Biochemistry Seminar*** (1–1) — The Staff
First half: Fri., 5:00 P.M. *Second half:* Fri., 4:00 P.M. The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.

232 ***Proteins and Amino Acids*** (1) — Carroll
Spring—Wed., 5:00 P.M. A lecture course. Prerequisite: Biochemistry 113 or 221.

241 ***Isotopes*** (2) — Gray
Fall—Sat., 8:00 A.M. Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromotography.

249–50 ***Introduction to Medical Research**** (3–3) — Bailey
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

251 ***Carbohydrate Metabolism*** (1) — Roe
1962–63 and alternate years: fall—Sat., 9:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

261 ***Biochemistry of the Lipids*** (1) — Swell, Treadwell
Fall—Sat., 12:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

295–96 ***Research in Biochemistry*** (arr.) — The Staff
Academic year—as arranged.

299–300 ***Thesis*** (3–3) — The Staff

BIOLOGY

Beginning with the academic year 1962–63 the work toward Bachelor's and Master's degrees in Biology will be offered jointly by the departments of Botany and Zoology.

In the summer of 1962 the following courses will be offered by the Department of Biology.

* This is an interdepartmental course. The student should register in the department directing his research.

1–2 *Survey in Biology* (3–3)
Summer 1962. Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to organic evolution, heredity, public health, and conservation. Material fee, $7 for each half. Biology 1 is not prerequisite to Biology 2.

115 *Cytology* (3)
Summer 1962. Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Prerequisite: one year of college work in biology, botany, or zoology. Material fee, $8.

211–12 *Research in Cytology* (arr.)
Summer 1962. Individual problems for advanced students interested in this field.

299–300 *Thesis* (3–3)
Summer 1962.

BOTANY*

Professor R. B. Stevens *(Chairman)*
Professorial Lecturer L. B. Smith
Associate Research Professor J. M. Kaper
Associate Professorial Lecturers Kittie Parker, Caroline Adams, R. S. Sigafoos, Edward Hacskaylo, H. M. Cathey
Lecturers G. A. Livingston, W. A. Shropshire, Jr.

Bachelor of Arts or *Bachelor of Science with a major in Botany (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53, including Biology 1–2†, or the equivalent.

Required: in addition to the general requirements, pages 58–62, a minimum of twenty-four semester hours of second-group courses in Botany or in a combination of Botany and related sciences as approved by the Chairman.

Bachelor of Arts or *Bachelor of Science with a major in Biology (Departmental).*—This interdepartmental major may be arranged in conjunction with the Department of Zoology. Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53, including Biology 1–2†, or the equivalent.

Required: in addition to the general requirements, pages 58–62, a minimum of twenty-four semester hours of second-group courses in Botany and Zoology, as approved by the Chairman of either Department.

Master of Arts or *Master of Science in the field of Botany.*—Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Botany or Biology.

Required: the general requirements, pages 64–66.

Master of Arts or *Master of Science in the field of Biology.*—This interdepartmental field may be arranged in conjunction with the Department of Zoology. Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Botany, Zoology, or Biology.

Required: the general requirements, pages 64–66.

Doctor of Philosophy (in a field of Botany or Biology).—See pages 67–73.

Bachelor of Arts in Education with a teaching field in Biology.—Prerequisite: the Education curriculum, pages 54–55.

Required: the Biology option and the professional courses listed in the School of Education Catalogue.

* The Staff of Instruction here listed is for the academic year 1961–62.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

BIOLOGY*

First Group

1–2 *Introductory Biology (4–4)** — The Staff

An interdepartmental course. Lecture (2 hours), laboratory (4 hours).
Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.
Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.
This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

BOTANY

Second Group*

105 *Field Botany* (3) — Parker

Lecture (1 hour), laboratory and field (4 hours). 1963 and alternate summers. A course, primarily for nonspecialists, emphasizing local flora.

106 *Plant Growth* (3) — Hacskaylo, Shropshire

Lecture (2 hours), laboratory (2 hours). Summer 1962 (as Botany 116). 1962 and alternate summers. A course, primarily for nonspecialists, emphasizing practical problems of growing and caring for plants. Material fee, $8.

107–8 *Organic Evolution*† (3–3) — Bowman

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. A study of the theories of organic evolution and present ideas on the principal lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechaniams involved in this process from the fields of genetics and cytology.

109–10 *Plant Morphology* (3–3) — Adams

1963–64 and alternate years. *First half:* seed plants—lecture (2 hours), laboratory (2 hours); material fee, $8. *Second half:* lower groups—lecture (1 hour), laboratory and field (4 hours).

115–16 *Cytology*† (3–3) — Bowman

Lecture and laboratory. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—Botany 115 (3) (as Biology 115). Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Material fee, $8 a semester.

125–26 *Plant Taxonomy* (3–3) — Parker

Lecture (1 hour), laboratory and field (4 hours). 1963–64 and alternate years.

127 *Genetics*† (3)

Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man.

131–32 *Mycology* (3–3) — Stevens, Hacskaylo

Lecture (2 hours), laboratory (2 hours). 1962–63 and alternate years: academic year—evening. Material fee, $8 a semester.

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* Biology 1–2 is prerequisite to all second-group courses, except by permission of the instructor. Beginning with the academic year 1962–63, Biology 1–2 *Introductory Biology* (4–4) replaces Botany 1–2 *General Botany* (3–3) and Zoology 1–2 *Introduction to Zoology* (4–4). Botany 1–2 and Zoology 1–2 will be offered for the last time in the summer of 1962.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

133–34 *Plant Pathology* (3–3) Stevens
Lecture (2 hours), laboratory (2 hours). 1963–64 and alternate years. Material fee, $8 a semester.

135–36 *Plant Physiology* (3–3) Cathey
Lecture (2 hours), laboratory (2 hours). 1962–63 and alternate years: academic year—evening. Prerequisite: Chemistry 11–12 or permission of the instructor. Material fee, $8 a semester.

140 *Cell Physiology** (3) Shropshire
Spring—evening. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12.

141–42 *Plant Ecology* (3–3) Sigafoos
Lecture (1 hour), laboratory and field (4 hours). 1962–63 and alternate years: academic year—evening.

THIRD GROUP

201–2 *Seminar: Cytology** (3–3) Bowman
Academic year—evening.

221–22 *Seminar: Taxonomy* (3–3) Smith
1962–63 and every fourth year: academic year—as arranged.

231–32 *Seminar: Mycology and Plant Pathology* (3–3) Stevens
1964–65 and every fourth year.

235–36 *Seminar: Plant Physiology* (3–3) Cathey, Hacskaylo
1963–64 and every fourth year.

241–42 *Seminar: Plant Ecology* (3–3) Sigafoos
1965–66 and every fourth year.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962—Botany 295 (arr.) Fee to be arranged.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

BUSINESS AND PUBLIC ADMINISTRATION†

Professors A. R. Johnson, J. L. Jessup, J. C. Dockeray *(Chairman)*, D. S. Brown‡, A. M. Woodruff, G. C. Jacobus, R. B. Eastin, F. H. Gibbs, R. F. Ericson, G. L. Lippitt, T. H. Carroll

Professorial Lecturers M. E. Ogdon, K. E. Stromsem, J. L. Krieger, C. W. Clewlow, W. G. Torpey, J. N. Stonesifer, A. C. Lazure, K. F. McClure, F. I. Shaffner, C. E. Houston, C. G. Berns, Edward McCrensky, S. N. Alexander, Robert Kaye, L. C. Collins, J. P. Murphy

Associate Professors John Clayton, Leonard Prestwich, Waldo Sommers, D. R. Cloutier, L. I. Gintzig, T. R. Bennett II

Associate Professorial Lecturers John Provan, J. R. Snitzler, F. K. McTyier, V. B. Lewis, George Idelson, J. A. Morrow, Ross Pollock

Assistant Professors A. D. Larson, R. E. Griffiths, H. R. Page

Lecturers R. J. Bond, J. F. Doubleday, W. L. Jobanek, D. K. Good

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.
† The Staff of Instruction here listed is for the academic year 1961–62.
‡ On leave of absence fall semester 1961–62.

Bachelor of Business Administration.—See pages 56, 134–35.

Master of Arts in Government in the fields of International Affairs, Public Affairs, Public Administration, Personnel Administration, and Economic Policy.—See pages 135–38.

Master of Business Administration in the fields of General Business Administration, Hospital Administration, and Personnel Administration.—See pages 135–37, 138–39, 139–42.

Doctor of Business Administration.—Prerequisite: a Master's degree in Business Administration or a related field, or the equivalent, and proficiency in Statistics and Accounting to the satisfaction of the Committee on Doctoral Studies.

Required: thirty hours of graduate work beyond the Master's level, the passing of a general examination in six fields, and the writing and defending of a dissertation. See pages 142–43.

Bachelor of Arts in Education with teaching fields in Business Education (School of Education).—Prerequisite: the Education curriculum, pages 54–55.

Required: the Business Education option and the professional courses listed in the School of Education Catalogue.

BUSINESS AND PUBLIC ADMINISTRATION

Third Group

201 *Advanced Administrative Management* (3) Eastin, Ericson, Gibbs
(Replaces Business Administration 201 and Public Administration 210)
Fall—day and evening; spring—evening. An advanced course in administration emphasizing principles and practices common to administrative units of all kinds.

204 *Quantitative Factors in Administration* (3)
Spring—evening. Developments in quantitative methods of administration.

205 *Seminar in Communication and Executive Action* (3) Morrow
(Formerly Public Administration 242)
Spring—evening. Seminar in the communications processes. Research and analysis, identification of factors relating to receptivity; the dynamics of communication.

206 *Personnel Management* (3) Torpey
(Formerly Public Administration 231)
Fall—evening. Basic principles; structure and organization of personnel offices; responsibilities; interagency relationships; personnel staffing, training, and work measurement.

207–8 *Human Relations in Administration* (3–3) Bennett, Brown
(Replaces Business Administration 275–76, and Public Administration 241)
Academic year—evening. Individual, group, intergroup, and other human behavior and development; application of social science research to administration. Practical applications will be emphasized.

262 *Contemporary Administrative Theory and Practice* (3) Ericson
(Formerly Public Administration 262)
Spring—evening. Current theories and trends in management with particular attention to the behavioral sciences communications and applicability of research.

268 *Management Engineering* (3) Clewlow
(Formerly Business Administration 268)
Fall—day and evening; spring—evening. Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys including the study of work measurements, work simplification management audits, and other management improvement programs.

287 *Relation of Government to Business* (3) Clayton
(Formerly Business Administration 287)
Spring—evening. Activities of government in their relation to business management in such areas as labor relations, wages, production, and prices.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the following business and public administration courses for students enrolled in the Navy Graduate Financial Management Program and the Air Force Advanced Management Program.

206 *Personnel Management* (3)

207–8 *Human Relations in Administration* (3–3)

BUSINESS ADMINISTRATION

Second Group

101 *Introduction to Business* (3)
(Formerly Business Organization and Combination)
Fall—day and evening; spring—day; summer 1962. The business environment; its effects upon the decision making process.

102 *Fundamentals of Management* (3) Ericson, Page
Fall—day and evening; spring—day and evening; summer 1962. Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.

105 *Personnel Management* (3) Eastin, Stonesifer
Fall—day; spring—evening; summer 1962. Industrial personnel and manpower programs, organizations and policy in personnel activities.

106 *Problems in Personnel Management* (3) Eastin, Stonesifer
Spring—day. Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.

107 *Labor-Management Contracts* (3) Sommers
Fall—day; spring—evening. Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.

109 *Office Management* (3)
Fall—evening; spring—evening. Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.

113 *Real Estate* (3) Doubleday
Fall—evening. Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.

121 *Risk Management* (3) Doubleday
Spring—evening. A general course in underlying principles of property, life, marine, and casualty insurance, and the function of insurance in the economic life of a business or individual.

122 *Life Insurance and Estate Planning* (3) Doubleday
Spring—evening. Life insurance contracts, their use in providing protection and estate development.

131 *Business Finance* (3) Clayton
Fall—day; spring—day and evening. Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1–2.

136 *Credit Management* (3)
Spring—evening. Types and sources of credit information, credit relationships from the standpoint of the commercial bank and the commercial business enterprise. Prerequisite: Accounting 1–2.

138 *Investments* (3) — Dockeray, Shaffner
Spring—evening; summer 1962. Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1–2.

141 *Principles of Marketing* (3) — Prestwich
Fall—evening; spring—day; summer 1962. An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1–2.

142 *Marketing Management Problems* (3) — Prestwich
Spring—day. Practical problems of retailers, wholesalers, and manufacturers considered through the use of cases and text material; fundamental considerations in marketing decisions and the nature of the problem-solving process. Prerequisite: Business Administration 141.

143 *Marketing Research* (3) — Prestwich
Fall—day. Principles and practices of marketing research with particular emphasis upon basic methods and techniques, sources and interpretation of data, and presentation of results.

145 *Sales Management* (3) — Eastin
Spring—evening. Organization of the sales department, sales planning and forecasting, quotas, territories, performance standards, and analysis and control of distribution costs. Prerequisite: Business Administration 141.

147 *Advertising* (3) — Idelson
Fall—evening. Advertising as a function of marketing and merchandising; uses and limitations of advertising as a tool of management; fundamentals involved in getting a finished advertisement before potential customers; evaluation, criticism, and control of advertising.

150 *Procurement and Materials Management* (3) — Prestwich
Spring—evening. Purchasing organization, procedures, and policies; market relationships; selection of merchandise and sources of supply; procurement information and records; evaluation of procurement practices in industry and government.

153 *Principles of Personal Selling* (3) — Prestwich
Summer 1962. Basic principles that underlie personal selling and the practical application of these principles. Emphasis is given to the human factor. Career opportunities and the role of selling in our economy are also considered.

158 *Traffic Management* (3) — Kaye
Spring—evening. Organization and records of traffic department, routing of shipments, services by carriers, rates and charges, relation of shipper to transportation agencies.

161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3) — Berns, Collins, McClure
Fall—day and evening.

162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3) — Berns, Collins, Murphy
Spring—day and evening.

163 *Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts* (3) — Murphy
Fall—evening.

171 *Principles of Transportation* (3) — Clayton
Fall—evening. Impact of transport on society; development, economic characteristics, services, rates, and regulation of the various modes of domestic intercity transportation.

172 *Public Utilities* (3) Clayton

Not offered 1962–63. Legal and economic meaning of the public utility concept; development, services, economic characteristics, ratemaking, and regulation of the various utility industries, with particular emphasis on electric, gas, telephone, and urban transit industries.

173 *Commercial Motor Transportation* (3) Clayton

Fall—evening. Organization, management, services, economic characteristics, rates, and regulation of motor transport firms; highways and highway financing considered from the point of view of both producers and users of the services.

174 *Commercial Air Transportation* (3) Clayton

Spring—evening. Organization, management, services, economic characteristics, rates, and regulation of air transport firms; policies and activities of the government in the development, promotion, and control of air transport.

175 *Introduction to Foreign Trade* (3) Kaye

Fall—evening. Terminology, trade usages and practices, conditions essential to successful trading, economic bases of international trade, obstacles to trade, tariffs, impact of governmental controls on private trade. Prerequisite: Economics 1–2.

176 *Exporting and Importing* (3) Kaye

Not offered 1962–63. Policy and operating problems of foreign trade, financing; documentation, packing and transportation of shipments, ocean marine insurance, and U. S. Customs procedure and formalities.

178 *Foreign Markets* (3) Ogdon

Spring—evening. Pattern of world trade by countries and commodities, methods of preparing market surveys, selected regional market analyses. Prerequisite: Economics 1–2.

191 *Business Reports and Analyses* (3)

Fall—evening. Sources of management information, array and analysis of data, interpretation and presentation of the findings.

193 *Management Communication* (3) Morrow

Fall—evening; spring—day. A survey course in the problems of communication; written communication; style and format; oral communication: oral briefing and presentation; group leadership; rapid reading; completed staff work; and related subjects.

195 *Controllership* (3)

Fall—evening. The duties, responsibilities, and place of the controller in a business organization; relations of controller to other departments and regulatory bodies; and the controller's relation to price setting and inventories, depreciation policies, internal auditing, expense control and budgeting; and financial reports to management, stockholders, and employees. Prerequisite: Accounting 1–2. Open to seniors.

197 *Introduction to Business Policy* (3)

Not offered 1962–63. Significance of business policies in management; formulation of policies; relation of various organizational levels to policy making; some significant policies, including case problems.

198 *Case Problems in Management* (3) Eastin, Page

Fall—day and evening; spring—day and evening. Principals and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.

Third Group

201 *Advanced Management* (3)

Summer 1962. An advanced course in management emphasizing principles of management in relation to business enterprise.

209 *Seminar in Personnel Management* (3) **Eastin**
Fall—evening. Discussion of industrial personnel and manpower management, and research in advanced problems.

210 *The Personnel Manager* (3) **Jessup**
Spring—evening. The job of the personnel manager and his place in the organization; relations of the personnel manager to other executives; the personnel manager's policy role, and his relations with the chief executive. Key problems of the senior personnel executive.

213 *Urban Land Management* (3) **Woodruff**
Spring—evening. Background course for the developing curriculum in city planning. The course traces the forces that lie behind investment decisions which in turn determine the development of cities.

218 *Introduction to Data Processing* (3) **Doubleday**
Fall—evening; spring—evening. A survey of modern data processing systems with emphasis on the management problems associated with the installation and use of such systems.

219–20 *Data Processing: Mechanics and Applications* (3–3) Alexander, Glaser
Academic year—evening. Characteristics of major computer systems; relation to their selection and application to administrative processes. Feasibility studies. Relationship of data processing and quantitative methods of management. Case studies. Prerequisite: Business Administration 218.

227 *Linear Programming* (3) ———
Fall—evening. Introduction to the vocabulary and methodology of management science through the study of linear programming techniques. Case studies. Minimum mathematical tools are included.

228 *Introduction to Operations Research for Management* (3) ———
Spring—evening. Operations research as an approach to the solution of management problems. Emphasis is on the relevance and limitations of operations research. Practical applications are examined. Minimum mathematical tools are included.

231 *Corporate Financial Problems* (3) **Dockeray, Houston**
Fall—evening. Financial practice in promotion, consolidation, and mergers; capital structure adjustments; and reorganization.

232 *Seminar in Business Finance* (3) **Dockeray, Houston**
Spring—evening; summer of 1962. Research in advanced financial problems.

237 *Security Analysis* (3) **Dockeray, Shaffner**
Fall—evening. An advanced course in the applications of investment principles and analytical techniques to the selection of investments. Prerequisite: Business Administration 138.

238 *Seminar in Investments* (3) **Dockeray, Shaffner**
Not offered 1962–63. Research in investment problems, techniques of selection and the management of various types of funds. Prerequisite: Business Administration 138.

241–42 *Seminar in Marketing* (3–3) **Johnson, Prestwich**
Academic year—evening. An advanced course in marketing, emphasizing special and current problems in the field. (Business Administration 241 is not a prerequisite for Business Administration 242.)

250 *Contract Administration* (3) **Lazure**
Fall—evening. The management of government contracts with private suppliers.

251 *Seminar in Retail Management* (3) **Prestwich**
Not offered 1962–63. Research in retailing practices, with emphasis on trends, new developments, and current problems.

255–56 *Seminar in Foreign Trade* (3) Ogdon
Not offered 1962–63. Research, analysis, and discussion of foreign trade institutions, public and private.

273–74 *Readings in Business* (3–3) The Staff
Academic year—as arranged. Advanced readings in the fields of finance, marketing, and personnel management. Admission by permission of the instructor.

278 *The Dynamics of Business* (3) Clayton
Not offered 1962–63. An analysis of the structure of American business, including a study of trend and cyclical change in economic activity and their bearing upon governmental policy.

286 *Management in the Armed Forces* (3) Jessup
Fall—evening. Special problems of military organization and management; applicability of business management techniques to the armed forces.

288 *Executive Leadership* (3) Krieger
Fall—evening. Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and public administration; review of the literature, significant research findings, and practical illustrations.

291 *Seminar in Business Management* (3) Ericson, Page
Fall—evening; spring—evening. Research on various phases of management as practice in American industry.

293–94 *Business Research* (3–3) The Staff
Summer 1962.

296 *Seminar in Controllership* (3)
Spring—evening. Research on advanced problems of the controller in all types of business organization and the Federal Government.

297 *Case Studies in Business Administration* (3) Jessup
Academic year—evening. Problems of management are analyzed with the view of developing a practical solution; cases are used to show the problems of personnel in marketing, industrial management, finance, etc.

299–300 *Thesis* (3–3) Dockeray and Staff
Academic year—evening; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the following business administration courses for students enrolled in the following special programs: Navy Graduate Financial Management Program, Air Force Advanced Management Program, and Engineering Administration.

107 *Labor-Management Contracts* (3) (Summer 1962)

235 *Financial Management* (3)

241 *Seminar in Marketing* (3)

253 *Procurement and Distribution* (3)

261 *Seminar in Advanced Management* (3)

263–64 *Business Organization and Management* (3–3)

268 *Management Engineering* (3) (Summer 1962)

269 *Readings and Conferences in Controllership* (2 or 3) (Summer 1962)

275 *Human Relations in Business* (3) (Summer 1962)

284 ***Readings and Conferences in Management*** (2)

290 ***Research Seminar in Management*** (3)

295 ***Research Seminar in Controllership*** (3)

296 ***Seminar in Controllership*** (3)

HOSPITAL ADMINISTRATION

Third Group

202 *Introduction to Medical Care Administration* (3) Griffiths

Lecture and discussion (2 hours), laboratory (2 hours). Fall—day and evening. Survey of organizations and activities involved in the maintenance of community health, national public health, hospital bodies, communicable diseases, preventive medicine, medical terminology, biostatistics, and environmental sanitation.

203–4 *Hospital Organization and Management I-II* (3–3) Gintzig

Lecture and discussion (2 hours), laboratory (2 hours). Academic year—day and evening. The history and current character of institutional medical care. Organizational functions and structure of various kinds of hospitals, including psychiatric homes for aged, nursing homes, group clinics, and others related to health care administration. The laboratory is conducted by guest faculty. Prerequisite to Hospital Administration 204: Hospital Administration 203.

205 *Hospital Management Procedures* (3) Gintzig

Lecture and discussion—(2 hours), laboratory (2 hours). Fall—day and evening. A survey of hospital law; a study of hospital forms, procedures, and systems; hospital programs pertaining to disaster relief, safety, fire prevention; personnel, purchasing, and volunteer services; and the operational peculiarities of hospital departments. Prerequisite: Hospital Administration 203.

206 *Case Studies in Hospital Administration* (3) Gibbs

Spring—day and evening. A discussion of general ideas about administration as applied to practical cases. Emphasis is placed on policy making, planning, and controlling in hospitals. Prerequisite: Business and Public Administration 201 and Hospital Administration 203.

207 *Hospital Management Analysis* (3) Gintzig

Lecture (2 hours), laboratory (2 hours). Spring—day and evening. Methods of collecting, analyzing, reporting, and using information that can be made available to administrators of hospitals and other medical care institutions. One day each week is spent in a medical care institution. This time is devoted to an investigation on which written and oral reports are based. Prerequisite: Business and Public Administration 268 and Hospital Administration 203, 205.

209 *Hospital Finance and Planning* (3) Griffiths

Lecture (2 hours), laboratory (2 hours). Spring—day and evening. Medical economics to include sources of hospital income; fund raising drives; methods of procuring, using, budgeting, and accounting for hospital funds; pre-payment plans, impact on community of the cost of medical care. Regional and specific aspects of hospital planning, designing, constructing, equipping, and supplying. Prerequisite: Hospital Administration 202, 203.

285–86 *Readings in Medical Care Administration* (3–3) The Staff

Academic year—as arranged. Advanced studies in various aspects of hospital, nursing home, and other medical care administration and management. Admission by permission of the Coordinator.

293–94–95 *Hospital Residency I* (3–3–3) Gibbs

The twelve-month residency, beginning June 1 or July 1 of each year, has four major objectives: work experience under a qualified preceptor; periodic seminars with University staff; periodic written progress reports of work accomplished; and a final

written report of a major investigation. (Other courses may be substituted for Hospital Administration 294–95 as appropriate.)

296–97–98 *Hospital Residency II* (3–3–3) Gibbs
For selected students who take a second year of residency.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged.

Courses Offered in Special Program

In addition to the regular courses announced above, the University offers the following hospital administration courses for students enrolled in the Health Care Administration program.

107 *Medical Background Terminology** (3) The Staff
Lecture (3 hours), laboratory (2 hours). A basic course in medical background information, disease classification, and terminology.

108 *Medical Records Processing** (3) The Staff
Lecture (3 hours), laboratory (2 hours). Detailed consideration of methods of processing, preserving, and indexing medical records.

109 *The Medical Records Department** (3) The Staff
Lecture (3 hours), laboratory (2 hours). A study of the Medical Records Department in the hospital. Its characteristics and function.

110 *Preparation and Auditing of Medical Records** (3) The Staff
Lecture (3 hours), laboratory (2 hours). The origin, development, and evolution of the medical record.

111 *Statistical Development and Analysis** (3) The Staff
Lecture (3 hours), laboratory (2 hours). Development and analysis of statistical data required by the hospital for medical record purposes.

112–13–14 *Medical Records Internship** (3–3–3) The Staff
Work projects in appropriate hospitals under qualified preceptor and with faculty supervision.

150–51 *Survey of Medical Care Organization and Procedures* (3–3) Griffiths
Discussion and lecture (2 hours), laboratory (2 hours). A survey course for students in other fields or from medical care organizations, who wish an over-all knowledge of organization and procedures used in hospitals, nursing homes, and similar organizations. This is a two semester sequence. Students not wishing to take the courses for credit need not take the laboratory but are expected to attend and take part in the discussion and lecture sessions. Not open to majors in Hospital Administration.

160 *Medical and Nursing Care for Nursing Homes* (3) The Staff
A survey of the medical and nursing procedures designed for administrators of nursing homes and facilities for the aged.

161 *Business Procedures for Nursing Homes* (3) The Staff
Business procedures with special application to nursing homes and homes for the aged.

162–63 *Readings in Nursing Home Administration* (3–3) The Staff
Advanced studies in selected aspects of administration and care of nursing homes and homes for the aged.

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* Part of a sequence. Primarily for nondegree students from other countries; but may be offered for academic credit by special arrangement with the Coordinator of the Programs in Hospital Administration. Ordinarily the program offered twice each year is an accelerated six-month program beginning in February and September—or by arrangement at any time.

PUBLIC ADMINISTRATION

Third Group

211 *Problems of Governmental Organization* (3) _____

Fall—evening; summer 1962. Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships.

212 *Case Studies in Public Administration* (3) _____

Spring—evening; summer 1962. Analysis and discussion of problems in public management, approached by the group using primarily the case method.

213 *Administration in Government* (3) Brown

Fall—evening; spring—evening. Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

215 *Seminar in Comparative Administrative Systems* (3) _____

Fall—evening. Examination and analysis of the administrative systems of the major foreign governments with particular attention to practices applicable to administration in the United States.

221–22 *Staff Functions in Government* (3–3) Sommers

Academic year—evening. Designed primarily to provide an understanding of the nature, use, and problems of the staff functions as tools of management. Survey of such staff areas as personnel, budgeting, controllership, procurement, property management, the agency lawyer, security, public relations and information, planning, research, the secretariat, management engineering, auditing, accounting, and administrative services.

225–26 *Internship in the Administrative Processes* (3–3) Sommers

Academic year—as arranged. This course is open only to persons selected by government agencies for participation in approved intern programs.

232 *Federal Personnel Procedures* (3) Torpey

Spring—evening; summer 1962. Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.

233 *Seminar in Manpower Development and Utilization* (3) Sommers

Fall—evening. Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.

237 *Intermediate Management and Supervision* (3) Eastin

Fall—evening. The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.

251 *Governmental Budgeting* (3) _____

Fall—evening; spring—evening; summer 1962. The role of budgeting in management; the principles and practices of budgetary formulation and administration.

252 *Seminar in Planning and Programming* (3) Jacobus

Fall—evening. Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.

254 *Controllership in the Federal Services* (3) Krieger

Spring—evening. Function of the controller in federal agencies; special problems analyzed; comparison of the controller function in government and business.

259 *Government Procurement and Property Management* (3)

Not offered 1962–63. Principles and problems of government procurement; accounting and inventory; storage; development of specifications; property management.

260 *Seminar in Policy Formulation and Administration* (3) Jacobus
Fall—evening. Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.

261 *Public Opinion and the Administrator* (3) Stromsem
Fall—evening. Theories, techniques, and methods of working with the public; the use of interest groups in developing governmental programs; evaluating public relations programs; the importance of timing; use of public opinion measurement techniques.

271 *Reading and Conference Course in Public Management and Administration* (3) Brown
Not offered 1962–63. The purpose of this course is to provide advanced students with directed reading in specific areas of public management and administration.

272 *Seminar in Public Personnel Administration* (3) The Staff
Spring—as arranged. The purpose of this course is to provide advanced students with directed reading in specific areas of public personnel administration.

297 *Seminar in Public Administration* (3) The Staff
Summer 1962. Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships.

299–300 *Thesis* (3–3) The Staff
Academic year—evening; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the following public administration courses for students enrolled in the Air Force Advanced Management Program and in Engineering Administration.

213 *Administration in Government* (3)

251 *Governmental Budgeting* (3) (Summer 1962)

260 *Seminar in Policy Formulation and Administration* (3)

CHEMISTRY*

Professors B. D. Van Evera, S. N. Wrenn, C. R. Naeser *(Chairman)*, R. C. Vincent, W. F. Sager, R. E. Wood, T. P. Perros
Associate Professors J. W. Harkness, W. E. Schmidt, D. G. White
Associate Professorial Lecturer Margaret McPherson
Assistant Professors R. C. Sentz, Margaret Ethier

Registration.—Before completing registration each student must obtain from the representative of the Department an assignment to lecture, recitation, and laboratory sections.

Bachelor of Arts or *Bachelor of Science with a major in Chemistry (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53, including Chemistry 11–12, 21, and 22, Mathematics 29 and 30 or 22 and 23, Physics 11, 12, 13, 16; or 11, 14, 15, and 16.

Required: the general requirements, pages 58–62, including Chemistry 111–12, 113–14, 122, 134 (or 235–36), 151–52, and 135 or 155 (two semester hours), and a grade of "pass"

* The Staff of Instruction here listed is for the academic year 1961–62.

on the chemistry major examination at the end of the senior year. The correlated knowledge upon which the student will be examined includes the following fields: (1) analytical chemistry, (2) inorganic chemistry, (3) organic chemistry, (4) physical chemistry. The work of the junior and senior years must be approved by the Department. Chemistry 153 and the German language are required of all majors who wish to be certified to the American Chemical Society. Others may omit Chemistry 153 and may elect French or Russian. Two foreign languages are recommended for students planning to do graduate work.

Master of Arts or *Master of Science in the field of Chemistry.*—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Chemistry from this University, or the equivalent.

Required: the general requirements, pages 64–66. All prospective Master's candidates must take qualifying examinations in the fields of analytical, inorganic, organic, and physical chemistry. These examinations will be given during the first week of classes each semester, and are a part of the prerequisites for all advanced courses. At least two of these examinations must be taken at the beginning of the first year of registration and the remaining one(s) must be taken at the beginning of the second year. Deficiencies, if any, shall be eliminated by assignment to appropriate courses in the 100 group for which a limited amount of graduate credit may, upon petition, be assigned for courses normally taken by seniors. The thirty hours of required work must include Chemistry 213 and at least one three semester hour course in the 200 group in two of the three fields of analytical, inorganic, and organic chemistry. In addition, the thirty hours must include at least four semester hours of laboratory work, Chemistry 193 and 299–300. Chemistry 156 is prerequisite to thesis work in the field of organic chemistry. A reading knowledge examination in French or German (German preferred) must be passed before the second half of the work is started.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Science in Engineering with an option in Chemistry.—See pages 100–101, 103–4. The Chemistry courses required for this degree are the same as those required for the Bachelor of Science degree with the major in Chemistry as itemized above.

Bachelor of Arts in Education with a teaching field in Chemistry.—Prerequisite: the Education curriculum, pages 54–55.

Required: the Chemistry option and the professional courses listed in the School of Education Catalogue.

First Group

3–4 *Fundamentals of Physical Science* (4–4) — Schmidt, Ethier

A year course: credit is not given for the first half until the second half is completed. Lecture (3 hours), laboratory (3 hours). Academic year—day. Introduction to methods and achievements of physical science, covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, $11 a semester.

11–12 *General Chemistry* (4–4) — The Staff

A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. Elementary course in general chemistry. Prerequisite: one year of high school algebra. Laboratory fee, $18 a semester.

13–14 *General Chemistry* (4–4) — White

A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). Academic year—day and evening. A terminal course in general chemistry for students in the School of Engineering except those selecting the curriculum leading to the degree of Bachelor of Science in Engineering with a chemistry option. Those students should register for Chemistry 11–12 in their first year. Prerequisite: Physics 11 and Mathematics 21 or 29. Laboratory fee, $18 a semester.

21 *Qualitative Inorganic Analysis* (4) — Vincent

Lecture (2 hours), laboratory (6 hours). Fall—day and evening; spring—day and evening; summer 1962. Theoretical and practical study of methods of separating and

identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12 or a placement examination which may be waived at the discretion of the instructor. Laboratory fee, $18.

22 *Quantitative Inorganic Analysis I* (4) Schmidt
Lecture (2 hours), laboratory (6 hours). Spring—day and evening; summer 1962. Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, $18.

SECOND GROUP

111–12 *Physical Chemistry Lectures* (3–3) Wood
A year course: credit is not given for the first half until the second half is completed. Academic year—day and evening. Introduction to physical chemistry. Students registering for Chemistry 111–12 must register concurrently for Chemistry 113–14 unless they already have adequate credit for physical chemistry laboratory. Prerequisite: either (1) Chemistry 22 and 152, Mathematics 22 or 30, Physics 13 or 15, or (2) Chemistry 21, Mathematics 22 or 30, Physics 14.

113–14 *Physical Chemistry Laboratory* (2–2) Wood
A year course: credit is not given for the first half until the second half is completed. Academic year—day (also Saturday). Laboratory to accompany Chemistry 111–12. Students registering for Chemistry 113–14 must register concurrently for Chemistry 111–12 unless they already have credit for lectures in physical chemistry. Laboratory fee, $18 a semester.

122 *Quantitative Inorganic Analysis II* (4) Schmidt
Lecture (2 hours), laboratory (6 hours). Fall—day and evening. Continuation of Chemistry 22 including theory and practice of separations, organic reagents, electrochemistry, and colorimetry in analysis. Prerequisite: Chemistry 22. Laboratory fee, $18.

134 *Descriptive Inorganic Chemistry* (2) White
Spring—day. An intermediate level course emphasizing the descriptive chemistry of the elements. Prerequisite: Chemistry 22, 151.

135–36 *Inorganic Chemistry: Preparations* (2–2) Perros
First half: fall—day, spring—evening. *Second half:* spring—evening. Application of the technique of inorganic chemistry to the preparation and purification of a list of selected substances. Prerequisite: Chemistry 152 and 134. Laboratory fee, $18 a semester.

151–52 *Organic Chemistry* (4–4) Wrenn, Sager
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—lecture (3 hours), laboratory (3 hours), day and evening; summer 1962. *Second half:* spring—lecture (2 hours), laboratory (6 hours), day and evening; summer 1962. Chemistry of the compounds of carbon. Prerequisite*: Chemistry 21. Laboratory fee: Chemistry 151, $12; Chemistry 152, $20.

153 *Special Laboratory in Organic Chemistry* (1) Wrenn, Sager
Spring—day and evening. A course designed to give the chemistry major additional and broader training in the technique of organic chemistry than in Chemistry 151–52. Prerequisite: Chemistry 151. Prerequisite or concurrent registration: Chemistry 22 and 152. Laboratory fee, $12.

155 *Organic Chemistry: Preparations* (2 or 3) Wrenn
Spring—evening. Synthesis of organic compounds and application of the technique of organic chemistry to the preparation of pure compounds, using larger amounts and greater refinements than in Chemistry 151–52. Prerequisite: Chemistry 22 and 152. Laboratory fee, $10.50 a semester hour.

156 *Qualitative Organic Analysis* (3) Sentz
Fall: lecture (1 hour), laboratory (6 hours)—evening. Identification of pure organic compounds, separation of mixtures, and identification of their components. Re-

* This prerequisite may be waived in the case of the student who has earned a grade of *C* or better in Chemistry 12 within the past two years or by a placement examination.

quired of all students planning thesis work in Organic Chemistry. Prerequisite: Chemistry 22 and 152. Laboratory fee, $18.

191 *History of Chemistry* (2) Perros
1963–64 and alternate years. Historical development of chemistry. Prerequisite: Chemistry 22 and 152.

193 *Chemical Literature* (1) Wrenn
Fall—evening. A general course in chemical literature with reference work and reports. Prerequisite: Chemistry 22 and 152. Prerequisite or concurrent registration: Chemistry 111–12 and 113–14.

THIRD GROUP*

203 *Chemical Kinetics* (2) Wood
1963–64 and alternate years. The rates of chemical reactions and the factors influencing them. Prerequisite: Chemistry 112.

211–12 *Physical Chemistry* (2–1) Wood
Academic year—day and evening. Same course as 111–12. Chemistry 211–12 may be taken for credit only by special permission. Credit will be assigned only upon the satisfactory completion of Chemistry 213.

213 *Chemical Thermodynamics* (3) Wood
Fall—evening. Application of thermodynamics to chemical problems. Thermochemistry, homogeneous and heterogeneous equilibria, statistical calculation of thermodynamic properties, electrochemistry. Prerequisite: grade of *A* or *B* in Chemistry 111–12, *Satisfactory* in 211–12, or qualifying grade in physical chemistry qualifying examination.

216 *Statistical Mechanics* (3) Sager
1962–63 and alternate years: fall—evening. An introduction to classical and quantum statistics designed to acquaint the student with the basic principles and application of the method. Prerequisite or concurrent registration: Chemistry 213 or permission of instructor.

217 *Chemical Bonding* (2) Sager
1962–63 and alternate years: spring—evening. A survey of modern developments in the theory of valence with emphasis on application to problems of stability and structure of complex molecules. Prerequisite: Chemistry 213 or permission of instructor.

221–22 *Advanced Analytical Chemistry* (2 or 3–2 or 3) Schmidt
Lecture (2 hours), laboratory (3 hours—optional). *First half:* fall—evening. *Second half:* not offered 1962–63. Theory and application of recent methods of analysis including electrical and optical instrumentation. Prerequisite: Chemistry 22 and 122. The lectures may be taken for 2 credits a semester without laboratory work, either half may be taken first. Laboratory fee, $11 a semester.

231–32 *Special Topics in Inorganic Chemistry* (2–2) White, Perros
Academic year—evening. A series of one-semester courses covering such topics as (1) chemistry of the less familiar elements, (2) organometallic, organosilicon, and carbonyl compounds, and (3) co-ordination chemistry. Prerequisite: Chemistry 235.

233–34 *Radiochemistry* (2–2)
1962–63 and alternate years: academic year—evening. The preparation, properties, and uses of radioactive isotopes, both natural and artificial. Prerequisite: Chemistry 235–36.

235–36 *Inorganic Chemistry* (3–2) Naeser
Academic year—evening. Application of modern chemical theories to inorganic substances and reactions, followed by a detailed study, developed from the periodic table, of the chemistry of the more common elements. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111–12 and 113–14.

* The appropriate qualifying examination is prerequisite to all advanced courses.

251–52 *Advanced Organic Chemistry* (3–3) Sager
Academic year—evening. Syntheses, reactions, and properties of carbon compounds; fundamental theories of organic chemistry. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111–12, 113–14.

253 *Advanced Synthetic Organic Chemistry* (3) Wrenn
Spring—evening. Study of reactions employed in the synthesis of organic compounds. Prerequisite: Chemistry 251.

257 *Theoretical Organic Chemistry* (3) Sager
1963–64 and alternate years. Survey of modern theories of organic chemistry with emphasis on reaction mechanisms. Prerequisite: Chemistry 252.

291–92 *Seminars: Recent Developments in Chemistry* (1–1) The Staff
Academic year—day.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962. Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, $7.50 a semester hour.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962. Laboratory fee, $18 a semester.

CLASSICAL LANGUAGES AND LITERATURES*

Professor J. F. Latimer *(Chairman)*
Associate R. G. Crawford

Bachelor of Arts with a major in Latin (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including Latin 51–52 and History 39–40.

Required: in addition to the general requirements, pages 58–62, eighteen semester hours in Latin beyond first-group courses, Art 111, Philosophy 111. A reading knowledge of French or German, preferably both, is strongly recommended.

Latin 1–2 and 3–4, or Greek 11–12 and 13–14 satisfies the foreign language requirement, see page 52.

LATIN AND GREEK

First Group

1–2 *First-year Latin* (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Functional presentation of the essentials of the language, with appropriate reading selections; development of English derivatives; introduction to Roman life and literature.

3–4 *Second-year Latin* (3–3) Crawford
A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. A continuation of the first-year course, but with increased emphasis on Latin readings which illustrate Roman life and literature; continuation of vocabulary building in English. Prerequisite: Latin 1–2 or two years of high school Latin.

11–12 *First-year Greek* (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Essentials of grammar with appropriate reading selections.

* The Staff of Instruction here listed is for the academic year 1961–62.

13–14 *Second-year Greek* (3–3) **The Staff**
A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. 1963–64 and alternate years: academic year—evening; 1964–65 and alternate years: academic year—day. Review of grammar; rapid reading from selected Greek authors.

49–50 *Latin Grammar and Readings* (3–3) **The Staff**
1963–64 and alternate years: academic year—day. Primarily for graduate students preparing for reading examinations. Undergraduates admitted by permission of the instructor. No academic credit for graduate students. *First half:* essentials of Latin grammar with appropriate reading selections. *Second half:* continuation of grammar with selections from various Latin authors for rapid reading.

51–52 *Introduction to Latin Prose and Poetry* (3–3) **The Staff**
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Selections from Cicero and Caesar, Virgil and Ovid. Prerequisite: Latin 3–4 or three years of high school Latin.

SECOND GROUP

101–2 *Roman Comedy* (3–3) **The Staff**
1963–64 and alternate years: academic year—day. Selected plays from Plautus and Terence. Prerequisite: Latin 51–52 or permission of the Instructor.

111–12 *Roman History and Philosophy* (3–3) **The Staff**
Not offered 1962–63. Selections from Cicero, Sallust, Lucretius, and Livy. Prerequisite: Latin 51–52 or permission of the Instructor.

121–22 *Roman Lyric Poetry and Satire* (3–3) **The Staff**
Not offered 1962–63. Selections from Catullus, Horace, Juvenal, and Martial. Prerequisite: Latin 101–2 or permission of the Instructor.

COURSES IN ENGLISH TRANSLATION

FIRST GROUP

71–72 *Greek and Roman Backgrounds in Literature* (3–3) **Latimer**
First half: 1962–63 and alternate years: spring—day. *Second half:* 1963–64 and alternate years: fall—day. Selected Greek and Roman masterpieces and their literary influence. This course satisfies the literature requirement, see page 52.

SECOND GROUP

109–10 *Greek and Roman Drama* (3–3) **The Staff**
Not offered 1962–63. 1963–64 and alternate years: academic year—evening; 1964–65 and alternate years: academic year—day. Selected tragedies of Aeschylus, Sophocles, Euripides, and Seneca; selected comedies of Aristophanes and Menander, Plautus and Terence; historical development of classical drama.

CLASSICAL HEBREW

FIRST GROUP

21–22 *First-year Classical Hebrew* (3–3) **Seidman**
A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Fundamental principles of the language with practice in reading simple narrative prose.

23–24 *Second-year Classical Hebrew* (3–3) **Seidman**
A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. 1963–64 and alternate years: academic year—day; 1964–65 and alternate years: academic year—evening. Review of grammar and exegesis of selected passages from the Hebrew text of the Old Testament.

DERMATOLOGY AND SYPHILOLOGY*

Professor H. F. Anderson *(Chairman)*
Assistant Clinical Professors Hayden Kirby-Smith, J. Q. Gant, Jr., W. G. Ballinger
Associates W. M. Willett, Reuben Goodman, C. S. Brown
Clinical Instructor Manuel Landman

214 *Dermatology and Syphilology* — The Staff
Spring—2 hours a week for eight weeks. Lectures on diseases of the skin and syphilis.

317–18 *Clinic* — Brown
Case demonstrations, diagnosis, and treatment of skin diseases and syphilis. D. C. General Hospital.

407–8 *Clinic* — The Staff
Two hours a week as arranged in rotation during academic year. Dermatology and syphilology in infants and children. Children's Hospital.

409–10 *Clinic* — The Staff
Two hours a week as arranged in rotation during academic year. Clinical demonstrations, diseases of the skin. University Hospital.

ECONOMICS*

Professors A. E. Burns†, D. S. Watson, T. W. Holland, J. W. Kendrick, W. E. Schmidt
Professorial Lecturers Gerhard Colm, R. A. Young, Hans Heymann, Jr.
Associate Professors J. W. Skinner *(Chairman)*, Henry Solomon *(Research)*
Associate Professorial Lecturer R. L. Sammons
Instructors L. D. Bothwell, Ching-Yao Hsieh

Bachelor of Arts with a major in Economics (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including Economics 1–2 and Statistics 51.

Required: the general requirements, pages 58–62, and (1) Economics 101–2 and 121 and fifteen additional hours in second-group courses to be selected with the approval of the adviser; (2) Economics 198 which may be taken upon the completion of Economics 101–2 and 121; (3) Statistics 111, 112; (4) nine semester hours of other second-group courses selected with the approval of the adviser.

Bachelor of Arts with a major in Latin American Civilization (Field-of-Study).—See the Department of History.

Master of Arts in the field of Economics.—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or the equivalent.

Required: the general requirements, pages 64–66, including Economics 210, at least nine semester hours in economic theory, and a thesis (Economics 299–300).

Doctor of Philosophy.—See pages 67–73.

Master of Arts in Government with a major in Economic Policy.—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or the equivalent.

Required: the general requirements for the degree are stated on pages 135–37, 138. The thirty hours of required work must include Economics 210, 265–66, and the thesis, Economics, 299–300.

First Group

1–2 *Principles of Economics*‡ (3–3) — Skinner and Staff
Lecture (2 hours), recitation (1 hour). *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—evening; spring—day and evening;

* The Staff of Instruction here listed is for the academic year 1961–62.
† On sabbatical leave spring semester 1961–62.
‡ Economics 1–2 is prerequisite to all other courses in Economics.

summer 1962. Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

Second Group

101–2 *Economic Analysis* (3–3) — The Staff

First half: fall—day and evening; spring—evening; summer 1962. *Second half:* spring—day and evening. Analysis of demand, supply, and commodity pricing; theory of national income determination; pricing of productive services; welfare economics. Economics 101 is prerequisite to Economics 102.

104 *History of Economic Thought* (3) — Burns

Spring—day. History of the major schools of economic thought; influence of changing problems on the development of economic theory.

105 *Business Cycles* (3) — Kendrick

Fall—evening. Description and analysis of the facts of economic instability, survey of recent business cycle theory, forecasting, and consideration of counter-cyclical policies.

121 *Money and Banking* (3) ———

Fall—day and evening; spring—evening; summer 1962. Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.

123 *Monetary Theory and Policy* (3) ———

Fall—day. Principal contemporary theories, background of recent monetary policy.

133 *The Economy of the Soviet Union* (3)

Not offered 1962–63. Development and main features of the economic life of the Soviet Union (See History 145–46 and Geography 196).

141 *Unionism and Collective Bargaining* (3) — Holland

Fall—evening. The development and characteristics of American unionism and collective bargaining as economic and social institutions, appraisal of economic and social aspects, public policies and controls.

142 *Labor Economics* (3) — Holland

Spring—evening. Characteristics of the American labor force, operations of labor markets, wage theories and practices, impact of collective bargaining, causes and characteristics of unemployment, public policies and programs.

161–62 *Public Finance and Taxation* (3–3) ———

1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. General survey of government expenditures; sources and methods of taxation; economic effects of expenditures, taxes, and of government debt policies.

165 *Government Control of Economic Activity* (3) — Watson

Fall—day. Changing role of government in promoting and regulating economic activity, types and spheres of control.

181–82 *International Economics* (3–3) — Schmidt

Academic year—day and evening; summer 1962—Economics 181 (3). Survey of world economics, theories of international trade, analysis of international economic problems and the international organizations.

185–86 *Economic History and Problems of Latin America* (3–3) ———

Academic year—evening. Evolution of the economies of Latin America with particular emphasis on present structures and problems, considered in the regional, country, and sub-region contexts. Economics 185, special attention to Middle America; Economics 186, special attention to South America.

198 *Proseminar in Economics* (3) Skinner
Fall—as arranged; spring—as arranged. Comprehensive survey of economics. Prerequisite: Economics 101–2 and 121.

THIRD GROUP

201–2 *History and Literature of Economic Thought* (3–3) Burns
Academic year—evening. Critical analysis and interpretation of the development and the literature of economic thought, origins, and problems, of the major types of theory, and their relation to present problems and policies.

203–4 *Contemporary Economic Theory* (3–3) Watson
Academic year—evening. The contributions of Marshall, Chamberlin, Robinson, Hicks, and others.

205 *Theory of Employment and Income* (3) Kendrick
Fall—evening. Determinants of the level of employment and income. Keynesian and classical systems contrasted, and recent literature on the subject.

206 *Business Cycle Analysis* (3) Kendrick
Spring—evening. Empirical analysis of American business cycles; evaluation of the methodology and findings of the National Bureau of Economic Research. Statistical tests of theories of the business cycle.

208 *The National Income* (3) Kendrick
Spring—evening. The theory of economic aggregates; measurement and policy aspects of national income.

210 *Seminar in Economics* (3) Skinner
Academic year—evening. Methodology of economics, integration of economic theories, methods of research. Open only to students who have completed fifteen hours of graduate work in economics.

212 *Seminar in Price Theory* (3) Watson
Fall—evening. Advanced topics in the theory of relative prices. Prerequisite: Economics 203–4 or the equivalent.

213 *Economic Thought in the Twentieth Century* (3) Burns
Summer 1962. Continuation of Economics 201–2. The principal trends in economic thought during the present century.

215–16 *Mathematical Economics* (3–3) Solomon
Academic year—evening. Introduction to the uses of mathematics in economic theory.

217–18 *Survey of Economics* (3–3)
Academic year—evening. Survey of economic analysis and policy. Not open to graduate students in economics or economic policy.

219 *Managerial Economics* (3) Watson
Summer 1962. Analysis of price, production, and inventory policies of business firms.

221–22 *Monetary Theory* (3–3)
Academic year—evening. Contemporary monetary theories.

223–24 *Monetary Policy and Central Banking* (3–3) Young
Academic year—evening. The money system in its relation to national income; monetary policies of the Federal Reserve and other central banking systems.

231–32 *Quantitative Economics* (3–3) Solomon
Academic year—evening. Selected topics in quantitative economics.

241 *Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Fall—evening. An accelerated introductory course in labor economics primarily for graduate students in Personnel Administration.

244 *Problems in Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Spring—evening. Concentrated study of selected economic, social, and legal aspects of labor relations and labor economics.

246 *Foreign Labor Movements* (3) Holland
Spring—evening. Labor in the economic, social, and political structures of selected foreign countries. Contrasts and comparisons with the United States.

251 *Theories of Economic Development* (3) Schmidt
Fall—evening; summer 1962. Growth and change in economic activity, capital accumulation, innovations in technology and business organization.

253 *Productivity Analysis* (3) Kendrick
Fall—evening. Concepts and measures of productivity; relations to economic growth and to structural changes in the American economy.

261–62 *Public Finance and Fiscal Policy* (3–3) Colm
Academic year—evening. Special problems in contemporary public finance and fiscal policy.

263–64 *Theory of Public Finance* (3–3) ———
Academic year—evening. Criteria for the allocation of government expenditures, principles of taxation, fiscal policy for stable growth.

265–66 *Theory of Economic Policy* (3–3) Watson
Academic year—evening. The nature, forms, methods, and objectives of economic policy; the relation of economic theory to economic policy.

267 *Economic Organization of the Communist Orbit* (3) Heymann
Fall—evening. Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. (See also History 145–46, 247, and Geography 196.)

281–82 *International Economics* (3–3) Schmidt
Academic year—evening. The modern theories of international economics, the variables determining the balance of payments, techniques to obtain balance-of-payments equilibrium.

284 *United States Foreign Economic Policy* (3) Schmidt
Not offered 1962-63. Analysis of foreign aid program; international, commercial, and monetary policy of the United States; United States and international economic organization.

285–86 *Economic Development of Latin America* (3–3) Sammons
Academic year—evening. Current policies and programs, capital formation, public and private; foreign loans and investment; social and technological preconditions of investment.

287–88 *Latin America: Trade and Commodity Policy* (3–3)
Not offered 1962-63. Tariffs and exchange control systems, bilateral and general commercial agreements, terms of trade.

290 *Seminar in International Economics* (3) Schmidt
Spring—evening. Advanced topics in international economics. Prerequisite: Economics 281–82 or the equivalent.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

EDUCATION*

Professors J. H. Fox, B. H. Jarman†, B. S. Root *(Chairman)*, A. C. LaBue, G. L. Angel, W. T. Carroll

Professorial Lecturers Madaline Remmlein, Florence Lumsden, H. O. Johnson, Anthony Marinaccio, Clayton Hutchins, J. B. Holden, B. D. Joy, J. P. Walsh, D. D. Darland, K. E. Brown

Associate Professors Mary Coleman, W. A. McCauley, Carol St. Cyr, H. G. Detwiler

Associate Professorial Lecturers J. C. Lang, LuVerne Walker, R. R. Reed, Eugenia Nowlin, Beverly Crump, Mary Scott, H. M. Wilson, John Giancaspro, Hazel Wilson, Lucille Mitchell, J. L. Cameron, Samuel Kavruck

Assistant Professors R. E. Baker, R. W. Eller

Lecturers E. M. Logan, C. O. McDaniels, Ward Whipple, Harold Cushman, Marcella Bernstein, Edward Goldstein, Joanne Parker, W. B. Evans, Jr.

Field Studies

Director J. W. Charles, *Assistant Director* D. T. McNelis

Field Service Coordinators

Alexander Anderson, *Assistant Principal, Washington-Lee High School, Arlington, Va.;* Mary Maré, *Assistant Principal, Dean of Girls, Wakefield High School, Arlington, Va.;* C. M. Richmond, *Principal, Stratford Junior High School, Arlington, Va.*

Bachelor of Arts in Education.—Prerequisite: the Education curriculum, pages 54–55, or the equivalent, or a certificate of graduation from an approved normal school or the equivalent.

Required: the satisfactory completion of a program of at least sixty-six semester hours in addition to the general education background courses, pages 54–55. Each program is planned individually to meet the certification requirements of the student, see pages 119–22 and the School of Education Catalogue.

Master of Arts in Education.—Prerequisite: a Bachelor's degree from an accredited institution. Programs are planned individually. The following areas of specialization are available: (1) adult education, (2) classroom teaching—to include strengthening mastery of teaching field, (3) comparative education, (4) curriculum, (5) elementary education, (6) employee training, (7) guidance, (8) history of education, (9) philosophy of education, (10) reading, (11) school administration—secondary or elementary school principalship, and (12) secondary education. (See pages 123–25.)

Advanced Professional Certificate.—See page 126.

Doctor of Education.—See pages 126–28.

A *Reading Clinic* — Coleman and Staff

Diagnosis of reading difficulties; individual or group lessons without academic credit. Fee: for individual diagnosis, $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups with common reading difficulties, $3.25.

Second Group

108 *Human Development, Learning, and Teaching* (3) — Baker and Staff

(Formerly Education 109–10)

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall—day and evening; spring—day and evening; summer 1962 (as Education 109–10 (3–3)). For the general student as well as the prospective teacher. Principles of

* The Staff of Instruction here listed is for the academic year 1961–62

† On leave of absence fall semester 1961–62.

effective teaching based on an understanding of human development and the nature of learning. **Prerequisite: Psychology 22 or 121.**

111 *Methods in Elementary Education* (12) — Baker and Staff

Fall—Monday through Friday mornings. For seniors in the elementary school curriculum. Methods, materials, appraisal, and field experiences in elementary schools. Problems and procedures in teaching the language arts (including reading, literature for children, oral and written expression, spelling, and handwriting), arithmetic and science, social studies. Planning units of work, general classroom procedures, and evaluation of pupil progress. Observation and participation two mornings a week. **Prerequisite: Education 108 and 123.**

112 *Educational Measurement* (3) — McCauley, Kavruck

Fall—day; spring—evening; summer 1962. Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. **Prerequisite: Education 108 and 123.**

113 *Elementary School Art* (3) — Nowlin

Fall and spring: lecture and laboratory (3 hours)—evening, field work—as arranged; summer 1962 (Crump). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22, or 121. Material fee, $4.50.

114 *Elementary School Music* (3) — Reed

Fall and spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962. For undergraduates in the elementary school curriculum. Materials and methods. **Prerequisite: Psychology 1 and 22, or 121.**

115 *Teaching of Reading in the Elementary School** (3) — Parker

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 108 and 123 or teaching experience.

116 *Elementary School Social Studies** (3) — Evans

Fall: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962 (Cushman). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

117 *Elementary School Science** (3) — St. Cyr

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

120 *Elementary School Arithmetic** (3) — Scott

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962 (Baker). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

123 *Society and the School* (3) — St. Cyr and Staff

(Formerly Education 121–22)

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall—day and evening; spring—day and evening; summer 1962 (as Education 121–22 (3–3)). For the general student as well as the prospective teacher. Historical and sociological development of education at the local, national, and international levels; cooperation of the school with other community agencies; organization and operation of schools; functions of school personnel.

128 *Children's Literature** (3) — Walker

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962 (Wilson). For teachers. Exploring and evaluating the newer books for children

* This course may not be taken by students who have completed or who plan to enroll in Education 111.

and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.

131 *Principles and Methods of Secondary School Teaching* (3) Detwiler, Myers, Stallings

Lecture (2 hours), field work (2 hours). Fall—day and evening; spring—day. For seniors in the secondary school curriculum. Course, unit, and lesson planning; practical techniques used in connection with motivation, the assignment, group procedures, directing study, individual differences, evaluation, clerical routines, disciplines, the homeroom, activity sponsorship, public relations. Prerequisite: Education 108 and 123.

134 *Student Teaching in Secondary Schools* (6 to 9) Detwiler and Staff

134A: fall—as arranged; spring—as arranged. 134B, 134C, 134D: spring—as arranged. For seniors in the secondary school curriculum. Sections A and B are for full-time academic majors (Detwiler). Section C is for academic majors in the intensive program (Detwiler). Section D is for physical education majors (Myers, Stallings). Education 134 student teaching fee, $50. Admission by permission of the instructor. Prerequisite: Education 108 and 123.

135 *Student Teaching in Elementary Schools* (9) Baker

135A and 135B: spring—as arranged. For seniors in the elementary school curriculum. Student-teaching fee, $50. Admission by permission of the instructor. Prerequisite: Education 108 and 123.

Special Methods Courses*

To be elected in the senior year after substantial preparation in the teaching fields concerned by the students in the secondary school curriculum. Course requirements and hours of credit vary with license requirements. Practices of successful teachers are studied and actual teaching content as found in current texts and courses of study is reviewed.

136 *Teaching English* (2 to 4) Lumsden

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 18 semester hours in English.

137 *Teaching Speech* (2 to 4) Kosh

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 18 semester hours in Speech or the permission of the instructor.

138 *Teaching Social Studies* (2 to 4) Jarman

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 24 semester hours of social studies.

140 *Teaching Mathematics* (2 to 4) Brown

Spring—evening. Prerequisite*: Mathematics through calculus.

144 *Teaching Science* (2 to 4) Eller

Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 24 to 40 semester hours of science.

146 *Teaching Foreign Languages* (2 to 4) McSpadden

Spring—day. Prerequisite*: 18 semester hours of one foreign language.

148 *Teaching Home Economics* (2 to 4) Towne

Spring—as arranged. Prerequisite*: 30 semester hours of Home Economics.

150 *Teaching Business Subjects* (2 to 4) Shott

Spring—as arranged. Prerequisite*: 30 semester hours of business education.

* Prerequisite to all special methods courses: Education 108, 123, and 131. Additional prerequisites are stated under each course.

THIRD GROUP*

200 *Human Development, Learning, and Teaching* (3) Lang
(Formerly Education 201–2)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall—evening; spring—evening. For graduate students. Principles of effective teaching based on an understanding of human growth and development and the nature of learning. Prerequisite: Psychology 1 and 22, or 121.

203–4 *Comparative Education* (3–3) Jarman
Academic year—evening. Comparison of foreign educational systems with those of the United States, particularly those of Russia, West Germany, Denmark, Switzerland, France, the British Isles, Canada, and Australia.

205–6 *The Curriculum*† (3–3) St. Cyr
Academic year—Saturday morning. For experienced teachers. *First half:* curriculum foundations and issues; comparison of curriculum patterns. *Second half:* principles and procedures in curriculum development; group consideration of student problems.

207 *Curriculum Materials*† (3) St. Cyr
Summer 1962. For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

209 *Child Growth and Development* (3) _____
Fall—evening. An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.

210 *Adolescent Growth and Development* (3) _____
Spring—evening. A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.

211 *Evaluation in Education*† (3) LaBue
Fall—evening. Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

212 *Educational Measurement* (3) _____
Spring—evening. Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.

213–14 *History of Education* (3–3) Jarman
Academic year—evening. *First half:* the European backgrounds of American education. *Second half:* the evolution of the American school system.

215 *Education of Exceptional Children*† (3) Goldstein
Fall—evening. For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

216 *Education of Slow-learning Children*† (3)
Not offered 1962–63. Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

* A degree from an accredited institution is prerequisite to all third-group courses.
† Prerequisite: adequate professional preparation.

217–18 *Philosophy of Education** (3–3) Jarman
Academic year—evening; summer 1962—Education 218 (3). *First half:* designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.

219 *Elementary School Classroom Procedures** (3) Baker
Summer 1962. Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.

223–24 *Reading Problems** (3–3) Coleman
Academic year—evening. For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.

225 *Elementary School Reading* (3) Coleman
Summer 1962. For experienced teachers. Developmental and remedial approaches to reading problems. Demonstration of diagnostic and corrective techniques used by the classroom teacher and the reading specialist.

226 *Reading in Secondary Schools* (3) Coleman
Spring—evening. For experienced teachers. Consideration of special problems in the content areas; diagnostic and corrective techniques and materials for the classroom teacher; reading improvement programs.

227 *Basic Issues in Elementary Education* (3) Baker
Fall—Saturday morning. A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.

228 *Instructional Areas in Elementary Education* (3) Baker
Spring—Saturday morning. Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.

229 *Administration of Elementary Education* (3) Bernstein
Fall—evening; summer 1962 (Carroll). For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building and integrating school and community life. Emphasis upon guide lines to action.

231 *Secondary School Classroom Procedures** (3) Giancaspro
Fall—evening; summer 1962 (Detwiler). Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.

233 *Audio-visual Education** (3) Logan
Spring: lecture (2 hours), laboratory (1 hour)—evening; summer 1962. Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, $7.

241 *Education of the Gifted** (3)
Spring—evening; summer 1962. For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.

243 *Human Relations in the Classroom** (3) Marinaccio
Summer 1962. Principles and practices involved in interpersonal relationships between learner and teacher and among learners.

245 *School and Community** (3) Angel
Fall—evening; spring—evening; summer 1962. The school as an important member of a team of social agencies that builds the community.

* Prerequisite: adequate professional preparation.

247 *Vocational Education** (3) Walsh
Fall—evening. Development in the United States; current conceptions, agencies involved, problems, and trends.

251 *Guidance in Secondary Schools** (3) McDaniels
Fall—evening; summer 1962 (Detwiler). Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.

252 *Organization and Administration of Guidance Services* (3)
Not offered 1962–63. Designed for guidance directors and supervisors and experienced school counselors who hope to qualify for such positions in the near future. Prerequisite: a minimum of 15 semester hours of approved graduate work in Measurement and Guidance.

254 *The Junior High School** (3) Root
Not offered 1962–63. Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities.

255–56 *Secondary Education** (3–3) Root
Academic year—Saturday morning; summer 1962. *First half:* current proposals for the improvement of secondary education. *Second half:* current problems in each of the subject-matter fields.

259–60 *Secondary School Management** (3–3) Johnson
Academic year—Saturday morning. For experienced teachers and administrators with two years of successful teaching in secondary schools. Management planning, execution, and control; criteria of good management; construction of the master schedule; leadership problems incident to the development of new policies and programs.

263–64 *Employee Training* (3–3) Root
Academic year—evening. *First half:* nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half:* administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265–66 *Teaching Secondary School English* (3–3) Lumsden
Not offered 1962–63. A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half:* communication skills—structural linguistics, composition, and speech. *Second half:* American and English literature.

267–68 *Teaching Secondary School Social Studies* (3–3) Whipple
Academic year—evening. A refresher course for teachers of the Social Studies. Discussion of new approaches to high school content. Offered in cooperation with the departments of History, Political Science, Geography, Economics, and Sociology and Anthropology.

271 *The Teacher and School Administration** (3) Fox
Fall—evening; summer 1962 (Carroll). A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

272 *The Teacher and School Supervision** (3) Fox
Spring—evening; summer 1962. Nature, organization, human relationships, and techniques.

273–74 *Teacher Education** (3–3) LaBue
Not offered 1962–63. *First half:* aims, objectives, and basic issues; study of outstanding and experimental programs. *Second half:* recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences.

* Prerequisite: adequate professional preparation.

275 *School Finance** (3) Hutchins
Summer 1962. Educational financial theory, practice, and control, including methods of financing.

276 *Seminar: Public Relations in School Administration** (3) Joy
Not offered 1962–63. Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

277 *Administration of School Personnel** (3) Carroll
Summer 1962. Techniques and problems of administration related to more effective service of staff personnel.

278 *School Law** (3) Remmlein
Summer 1962. Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.

279–80 *Adult Education** (3–3) Detwiler, Holden
Academic year—evening; summer 1962—Education 280 (3). *First half:* current concepts and objectives, agencies involved, programs on all levels—international through community. *Second half:* the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.

283–84 *Higher Education** (3–3) Jarman
Academic year—evening. *First half:* development, present status, and outlook for American colleges; purposes of higher education, current and projected programs; trends in curriculum, instruction, administration, and evaluation of outcomes. *Second half:* principles in development of college programs; study of curricula in liberal arts and professional fields; relationship of institutional services and facilities to the instructional program.

285 *Extra-classroom Activities** (3)
Not offered 1962–63. Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.

287–88 *Clinical Study of Reading Problems** (3–3) Coleman
Academic year—evening. For advanced students. Diagnostic and corrective work under supervision of the Reading Clinic. Each student is expected to diagnose and treat pupils who are retarded in reading. Case studies are presented and criticized. Prerequisite: Education 223–24 or the equivalent. Material fee, $5 a semester.

289 *Supervisory Problems in Reading** (3) Coleman
Not offered 1962–63. For experienced teachers, principals, supervisors, and superintendents. Considers the problems involved in planning, reorganizing, and improving the total reading program, in promoting cooperative effort on the part of the staff toward increasing teaching efficiency.

291 *Planning the School Plant* (3) Cameron
Not offered 1962–63. Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.

293–94 *Research* (3–3) The Staff
Academic year—as arranged. Individual research under the guidance of a member of the staff. Program and conferences arranged with an instructor.

295 *Educational Research Methods and Procedures* (3) LaBue
Fall—day; spring—evening; summer 1962. Required of all candidates for graduate degrees in Education. To be taken early in the student's graduate program. Prerequisite: an elementary course in statistics.

296 *Seminar in Educational Research* (3) LaBue
Spring—evening. Designed to help students analyze scientific approaches to problems in education; evaluate the application of research techniques to typical problems;

* Prerequisite: adequate professional preparation.

define, organize, and conduct research studies; and prepare proposals for sponsored research. Required of all candidates for the Doctor of Education degree and open, with permission, to candidates for other advanced degrees. Prerequisite: Education 295 or the equivalent.

297 *Reading in Education* — The Staff

Academic year—late afternoon; summer 1962. To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, $30.

299–300 *Thesis* (3–3) — The Staff

Academic year—as arranged. Required of all Master of Arts candidates writing Master's theses.

ENGINEERING*

Professors C. H. Walther, M. A. Mason, R. A. Hechtman *(Chairman, Civil Engineering)*, P. A. Crafton, Louis dePian, N. T. Grisamore *(Chairman, Electrical Engineering)*, H. E. Smith, Ben Lindberg

Adjunct Professors L. A. Guildner, A. G. McNish, Gunther Sorger, Churchill Eisenhart, Theodore Young

Professorial Lecturers F. K. Harris, F. P. Hall, Laurence Heilprin, H. L. Stier, Ezra Glaser

Associate Professors John Kaye, G. M. Arkilic, A. C. Murdaugh, R. R. Fox, M. S. Ojalvo

Associate Professorial Lecturers K. W. Webb, M. J. Rosenbaum

Assistant Professors R. L. Dedrick, C. D. Ferris, E. H. Braun, R. E. Cronin, John Eftis

Lecturers George Abraham, W. W. Balwanz, P. H. Sawitz, L. S. Rotolo, J. A. Cunningham, Howard Eisner, Milton Gussow, D. C. Rohlfs, P. S. Morgan, Jr., Gershon Kulin

Instructors R. M. Moore, A. C. Meltzer, J. D. O'Neale, T. P. Carroll, D. K. Anand, Ronald Feit

Associate T. B. Wiggins

Engineering Technologist Certificate.—For requirements see pages 99, 100–101, 111.
Bachelor of Civil Engineering.—For requirements see pages 100–102.
Bachelor of Electrical Engineering.—For requirements see pages 100–101, 102.
Bachelor of Mechanical Engineering.—For requirements see pages 100–101, 103.
Bachelor of Science in Engineering.—For requirements see pages 100–101, 103–4, 111–12.
Master of Engineering Administration.—For requirements see pages 104–5, 106–7.
Master of Science in Engineering.—For requirements see pages 104–6.
Doctor of Science.—Pages 107–9.

Civil Engineering

First Group

21 *Rigid Body Mechanics I* (3) — The Staff

Fall—day and evening; spring—evening. An introduction to vector mechanics. Newton's Laws; equilibrium of a particle and systems of particles, rigid bodies, and systems of rigid bodies; kinematics. Prerequisite: Mathematics 31 or 24, Physics 14.

24 *Mechanics of Deformable Bodies I* (3) — The Staff

Fall—evening; spring—day and evening. An introduction to elastic and inelastic behavior of solids acted upon by forces. Analysis of stress and strain at a point; stress-

* The Staff of Instruction here listed is for the academic year 1961–62.

strain temperature relations; criteria for yielding; applications including tension, compression, torsion, bending, shear, and buckling. Prerequisite: Civil Engineering 21, Mathematics 31 or 24.

SECOND GROUP

112 *Surveying* (3) — The Staff

Spring: lecture (2 hours), field work (2 hours)—Saturday. Plane surveying, including measurements, simple curves, and topographical surveying; space measurements; treatment of observational errors; earthwork computations; field astronomy. Prerequisite: Mathematics 31 or 24, Mechanical Engineering 10. Surveying fee, $13.

121 *Rigid Body Mechanics II* (3) — The Staff

Fall—day and evening; spring—evening. Continuation of Civil Engineering 21. Kinematics and dynamics of a particle, systems of particles, and rigid bodies and their applications. Prerequisite: Civil Engineering 21, Mathematics 111.

125 *Engineering Materials* (4) — Murdaugh and Staff

Fall: lecture and laboratory—day and evening. Mechanical and surface properties of engineering solids; relationships between the structure of a material and its mechanical and physical behavior; principles of the control of the properties of metals and nonmetallic solids. Prerequisite: Chemistry 12 or 14, Civil Engineering 24, Physics 16. Laboratory fee, $11.

128 *Soil Mechanics* (3) — Fox

1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Mechanical properties of soils; theory and applications of lateral earth pressure, bearing capacity, and settlement of foundations. Prerequisite: Civil Engineering 125, 137, 144.

132 *Fluid Mechanics* (3) — Mason and Staff

Fall: lecture and laboratory—evening; spring: lecture and laboratory—day and evening. Development of the fundamental principles of flow of viscous and ideal compressible and incompressible fluids; dimensional analysis and model theory; laboratory work emphasizes principles, analysis of tests, and systematic observations of phenomena. Prerequisite: Civil Engineering 121, Mathematics 111, Mechanical Engineering 113. Laboratory fee, $11.

135 *Hydraulic Engineering* (3) — The Staff

1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Applied theoretical fluid mechanics, pipe and open channel flow, hydroelectric development, drainage and irrigation, control of river flow and floods, water supply and sewerage. Prerequisite: Civil Engineering 137.

137 *Applied Earth Sciences* (3) — Fox

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Formation and properties of soils and rock, seismology, climatology, hydrology, ground water and river flow. Prerequisite: Civil Engineering 125, 132.

143–44 *Structural Theory I–II* (4–4) — Hechtman, Walther

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Theory and structural behavior of statically determinate and indeterminate plane and space structures by classical and modern methods; included are model analysis, plastic collapse, numerical methods, and matrix algebra methods. Prerequisite or concurrent registration: Civil Engineering 125, Mathematics 111. Laboratory fee, $11 a semester.

145 *Metal Structures* (3) — Fox, Hechtman

1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Application of structural theory and engineering materials to the analysis and design of metal structures under static and moving loads; plastic design, buckling. Prerequisite: Civil Engineering 144, 157.

146 *Reinforced Concrete* (3) — Fox, Hechtman

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Theory and design of plain and reinforced concrete structures including prestressed

concrete and ultimate strength design. Prerequisite: Civil Engineering 144. Prerequisite or concurrent registration: Civil Engineering 157.

154 *Structural Dynamics* (3) **Arkilic, Fox**
1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Free, forced, steady-state, and transient vibration of structural members and framed structures; earthquake, blast, and other dynamic loadings; methods of analysis including energy methods and applications of matrix algebra. Prerequisite: Civil Engineering 121, 144, Mathematics 111.

157 *Mechanics of Deformable Bodies II* (3) **Fox, Walther**
1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. An introduction to the advanced mechanics of deformable bodies including the theory of two-dimensional linear elasticity in cartesian and polar coordinates and the theory of perfectly plastic solids. Prerequisite: Civil Engineering 125, Mathematics 112. Prerequisite or concurrent registration: Civil Engineering 144 or Mechanical Engineering 123.

165 *Engineering Analysis and Planning* (3) **The Staff**
1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Mathematical analysis, planning, and economics of engineering problems and projects including modern computational methods. Prerequisite: senior standing in Civil Engineering.

166 *Transportation Engineering* (3) **The Staff**
Time to be arranged. Planning and systems analysis of transportation networks. Prerequisite: Civil Engineering 165.

168 *Regional and Urban Planning* (3) **Eftis**
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Regional and urban planning including engineering aspects in connection with transportation, water supply and sewerage, public safety, and convenience. Prerequisite: Civil Engineering 165.

195–96 *Problems in Civil Engineering* (arr.) **The Staff**
Academic year—as arranged. Special problems approved by the Staff. Prerequisite: senior standing.

THIRD GROUP

216 *Metal Structures* (3) **Hechtman**
Time to be arranged. Structural behavior and failure of metal structures; materials; residual stresses; analysis and design of connections and members; theory of plastic collapse of structures; plastic design.

217 *Ultimate Strength of Reinforced Concrete Structures* (3) **Fox**
Time to be arranged. Modes of failure of reinforced concrete structures; experimental data on failure; ultimate strength concepts for the analysis of beams, slabs, and columns.

218 *Prestressed Concrete Structures* (3) **Hechtman**
Time to be arranged. Structural behavior and failure of prestressed concrete structures; materials; theory, analysis, and design of prestressed concrete structures and members.

224 *Theory of Plates and Shells* (3) **Arkilic**
1962–63 and alternate years: spring—evening. Classical and modern theories of plates and shells, plates and cylindrical shells under different loadings and boundary conditions, equations for plates including shear, rotationally symmetric shells under small deformations and their applications.

226 *Plasticity of Solids* (3) **Hechtman**
1963–64 and alternate years: fall—evening. Plastic flow and fracture of solids; theory of elastic perfectly plastic solids, including basic concepts, limit analysis of beams, rigid frames, and plane stress problems; theory of fracture.

234 *Geotechnics in Soil Mechanics* (3) Fox
1962–63 and alternate years: fall—evening. Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action.

235 *Theoretical Soil Mechanics* (3) Fox
1962–63 and alternate years: spring—evening. Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics.

238 *Foundation Engineering* (3) Fox
Time to be arranged. Principles of soil mechanics and structural mechanics in the analysis and design of spread footings, mat and pile foundations, retaining walls, sheet piling and water front structures.

251 *Theory of Structures I* (3) Fox, Hechtman
Fall—evening. Classical and modern theories for plane statically indeterminate structures, matrix analysis of structures, special problems.

252 *Space Structures* (3) Hechtman
Spring—evening. Theory of structures in three dimensions; trusses, rigid frames, and thin-shell structures; matrix analysis and applications of computers.

253 *Theory of Structures II* (3) Hechtman
Time to be arranged. Statically indeterminate structural theory, including single and multi-span rigid frames and arches, deflection theory for arches and suspension bridges, thermal stress, and failure of structures.

254 *Theory of Structural Dynamics* (3) Arkilic
1963–64 and alternate years: spring—evening. Analysis of elastic structures under various dynamic loadings, both steady-state and transient, including vibrations of rigid frames, plates, and thin shells.

256 *Theory of Elastic Stability* (3) Hechtman
1962–63 and alternate years: fall—evening. Beam-column problems and methods of analysis (including numerical analysis); lateral buckling of beams; buckling of rigid frames, arches, plates, stiffened plates, and shells; inelastic buckling.

272 *Experimental Structural Analysis* (3) Hechtman
Time to be arranged. Experimental analysis of truss, rigid frame, plate, and shell structures; large- and small-deflection models; similitude.

275 *Concepts of Structural Design* (3) Hechtman
Time to be arranged. Mechanical behavior and failure of structures as determined by properties of materials, nature of structure, and type of loading; selection of type of structure; structural analysis, its applications and possible simplifications.

295–96 *Research* (arr.) The Staff
Academic year—as arranged. Research or directed study.

Electrical Engineering

First Group

11–12 *Fundamentals of Electrical Engineering* (3–3) The Staff
Academic year—day and evening. Electric and magnetic fields, d-c and a-c electrical circuits and networks, energy sources, electromechanical energy conversion, power, electronic devices, and circuits. *First half:* circuits and electronics. *Second half:* energy, power, and fields. Prerequisite to Electrical Engineering 11: Physics 15 and Mathematics 111 or concurrent registration. Prerequisite to Electrical Engineering 12: Electrical Engineering 11.

SECOND GROUP

102 ***Engineering Electronics I*** (3) **Braun**
Fall—day and evening. Vacuum tube and solid state devices as circuit elements, equivalent circuits, voltage and power amplifiers. Emphasis placed on design of electronic circuits. Prerequisite: Electrical Engineering 12, Mathematics 112.

103 ***Electric and Magnetic Fields*** (3) **dePian**
Fall—day and evening. Introduction to vector analysis and its application to static electric and magnetic fields; method of images, solid angle, particle motion in electric and magnetic fields. Prerequisite: Electrical Engineering 12, Mathematics 112.

104 ***Field Analysis*** (3) **Ferris**
Spring—day and evening. Vector potential, magnetic scalar potential, conformal mapping, solutions of Laplace's equation, field plotting, analogues. Introduction to Maxwell's equations and electromagnetic waves. Prerequisite: Electrical Engineering 103, Mathematics 112.

107 ***Steady-state Network Analysis*** (3) **Ferris**
Fall—day and evening. Four-terminal networks, network theorems, poles and zeroes of network functions, resonance, filters, coupled circuits, transmission lines. Fourier series, matrices. Prerequisite: Electrical Engineering 11, Mathematics 112.

111 ***Electrical Measurements*** (3) **Meltzer**
Fall—day and evening. Systems of units; theory of errors; d-c indicating instruments and galvanometer dynamics; precision measurement of voltage, current, and resistance. Theory of a-c indicating instruments, a-c bridges, waveforms, frequency measurements, measurement of power and energy. Prerequisite: Electrical Engineering 12, Mathematics 112.

113 ***Electrical Engineering Laboratory I*** (2) **Meltzer**
Fall—day and evening. Experiments in d-c and a-c circuits, instruments, and machines. Prerequisite: Electrical Engineering 12, Mathematics 112. Laboratory fee, $11.

118 ***Electrical Energy Conversion*** (3) **Meltzer**
Spring—day and evening. Analysis of physical systems involving electrical, mechanical, and thermal energy conversion; mathematical formulations using the Euler-Lagrange equation; transient and steady-state analysis of special machines including the generalized rotating energy converter. Prerequisite: Electrical Engineering 12, Mathematics 112. Prerequisite or concurrent registration: Electrical Engineering 104, 112.

122 ***Electrical Engineering Laboratory II*** (2) **Meltzer, Rohlfs**
Spring—day and evening. Continuation of Electrical Engineering 113. Measurement of electrical quantities, design and construction of laboratory circuits. Prerequisite: Electrical Engineering 102, 103, 107, 111, 113. Laboratory fee, $11.

123–24 ***Electrical Engineering Laboratory III–IV*** (2–2) **Meltzer, Rohlfs**
Academic year—day and evening. *First half:* theory and use of electronic devices and instruments. Experiments at radio- and microwave frequencies. Prerequisite to 123: Electrical Engineering 122 and senior status. *Second half:* Creative projects in electrical and eletromechanical devices and systems carried out under individual supervision. Prerequisite to 124: Electrical Engineering 123. Laboratory fee, $11 a semester.

127 ***General Network Analysis*** (3) **Ferris**
Fall—day and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeroes of network functions, correlation of time and frequency domains, elements of network synthesis. Prerequisite: Electrical Engineering 107, Mathematics 112.

133 ***Engineering Analysis*** (3) **dePian**
Fall—day. Application of fundamental principles of engineering, physics, and mathematics to problems in various fields of engineering. Emphasis is placed on problem solving using concepts previously studied. Prerequisite: Civil Engineering 121, Electrical Engineering 102, Mathematics 112, Physics 16.

134 *Engineering Electronics II* (3) Braun
Spring—day and evening. Continuation of Electrical Engineering 102. Feedback amplifiers, oscillators, relaxation circuits, computing circuits, modulation. Prerequisite: Electrical Engineering 102.

136 *Electromagnetic Waves* (3) Ferris
Spring—day and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices. Prerequisite: Electrical Engineering 104, Mathematics 112.

137 *Active Network Theory* (3) dePian
Fall—day and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems. Prerequisite: Electrical Engineering 102 or Physics 132, Electrical Engineering 107, Mathematics 112.

142 *Information Theory* (3) Grisamore
Spring—day and evening. Introduction to probability. Discrete and continuous information sources. Coding, transmission, channel capacity, correlation function. Noise in information systems. Prerequisites: Mathematics 112 and senior status.

171 *Digital Circuitry and Systems* (3) Grisamore, Rotolo
Fall—day. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 134 or Physics 132.

172 *Digital Techniques* (3) Rotolo
Spring—day. Continuation of Electrical Engineering 171. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams. Prerequisite: Electrical Engineering 171.

174 *Digital and Analog Computer Laboratory* (2) Wiggins
Spring—day. Theory and use of digital and analog computers: programming, operating, logical circuitry, design, troubleshooting. Prerequisite: Electrical Engineering 134, 171. Laboratory fee, $11.

THIRD GROUP

201 *General Network Analysis* (3) Sawitz
Spring—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, elements of network synthesis.

202 *Advanced Network Analysis* (3) dePian
Fall—evening. Advanced theory of lumped and distributed linear networks, matrices, stability, activity.

203 *Network Synthesis* (3) dePian
Spring—evening. Basic techniques in the synthesis of linear two- and three-terminal passive networks; positive real functions; Foster, Cauer, Brune, Bott-Duffin, Darlington procedures; elements of active network synthesis.

211 *Electromagnetic Waves* (3) Braun
Fall—day and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices.

212 *Field Analysis and Potential Theory* (3) Ferris
Spring—evening. Fields of force, divergence, Newtonian potentials at points of free space, solutions of Laplace's equation, harmonic functions, logarithmic potential

213 *Microwaves* (3) dePian
Fall—evening. Transmission lines; waveguides; antennas; resonators; amplifiers and oscillators; klystrons, magnetrons, traveling wave tubes.

214 *Electrodynamics* (3) _____
Spring—evening. Presence of moving matter in electromagnetic fields, force and energy in moving systems, relativistic concepts, tensors.

215 *Antennas* (3) _____
Fall—evening. Maxwell's equations, radiation, impedance, directional characteristics, arrays, aperture antennas.

221 *Active Network Theory* (3) dePian
Fall—day and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems.

222 *Physical Electronics* (3) Braun
Spring—evening. Physical principles underlying operation of various electronic devices including vacuum tubes, electron lenses, transistors, and recent solid-state electronic devices.

223 *High-frequency Electronics* (3) _____
Fall—evening. High frequency operation of electron tubes and semiconductor devices, transit time, bunching, pulse techniques.

224 *Industrial Electronics* (3) _____
Spring—evening. Gaseous tubes and applications; rectifiers; timing circuits; induction and dielectric heating; regulation and control, magnetic amplifiers.

225 *Electronic Measurements in Psychometrics and Medicine* (3) Ferris
Fall—evening. Theory of measurements in biological areas, field and circuit theory as a foundation for measurements, techniques for electronic measurements on biological specimens, problems in medicine and psychology with emphasis on measurements and measuring devices.

226 *Physical Basis for Medical Electronics* (3) Ferris
Spring—evening. Electrical and acoustical properties of biological material; structural components of biological material as they affect its dielectric and acoustical behavior, electrical relaxation phenomena in general and their application to biological material in particular, applications in diathermy and electrocardiography, impedance determination.

231 *Digital Circuitry and Systems* (3) Wiggins
Fall—day. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits.

232 *Digital Techniques* (3) Rotolo
Spring—day. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams.

233 *Digital Systems* (3) Cunningham
Fall—evening. The programmed system; system design of digital computers, special-purpose digital computers, reliability, data-processing techniques, analog-to-digital and digital-to-analog techniques.

234 *Automata and Self-organizing Systems* (3) Grisamore
Spring—evening. Effectively computable functions and Turing machines, digital computational methods in Boolean algebra, combinational circuits and their analysis, recursion circuits and their analysis, reliability of automata, networks of automata, artificial intelligence.

241 *Analysis of Modulation and Noise* (3) Grisamore
Fall—evening. Analysis by Fourier series and integrals of signals and linear networks, modulation and spectra, noise analysis including probability method of determining power spectra.

242 *Information Theory* (3) Eisner
Spring—evening. Discrete and continuous systems; ergodic ensembles and random processes; correlations, filtering, prediction; redundancy.

243 *Electromagnetic Wave Propagation* (3) _____
Fall—evening. Ground waves; space-wave propagation, atmospheric effects, ionosphere; maximum usable frequency; bandwidth.

244 *Communication Systems* (3) _____
Spring—evening. Radar; television; ultra-high frequency; navigational aids.

251 *Power Transmission* (3) Meltzer
Fall—evening. Transmission lines, exact and approximate equivalent circuits, standing waves, filtering, protection, radio interference, high voltage, line configurations.

252 *Power Generation* (3) Meltzer
Spring—evening. Steam, hydroelectric and nuclear plants, fuel cells and magnetohydrodynamics, efficiency, reheat cycles, stability, load factors, generator swings.

253 *Power Systems* (3) Meltzer
Fall—evening. Substations, transformers, distribution, networks; short and open circuit analysis; symmetrical components; stability; network analysers.

Engineering Administration

The School of Engineering offers the following courses primarily for candidates for the degree of Master of Engineering Administration. Other courses listed in this program are offered by the departments of Accounting, Business and Public Administration, Psychology, and Statistics.

Third Group

201 *Engineering Administration I* (3) Cronin and Staff
Fall—evening; spring—evening. The application of scientific method to the (1) planning element and (2) organizing element of the administrative process. Characteristics of plans, establishing objectives and goals, determining policies and procedures, preparing plans to meet stated objectives and goals, organization for planning, testing of plans. Characteristics of organization, patterns of departmentation authority, responsibility, levels of specialization, coordination, decentralization, work division, staff, committees. Introduction to analysis for decision making.

202 *Engineering Administration II* (3) Cronin and Staff
Fall—evening; spring—day and evening. Sequential to Engineering Administration I. The application of scientific method to the (3) directing or managing element and (4) control element of the administrative process. Personnel management, organized labor, executive leadership, communication, implications of automation, systems analysis for effective administration. Methods of evaluation and control of operations, e.g., financial analysis, budgeting, administrative audits.

204 *Administration of Engineering Contracts* (3) _____
Fall—evening. Study of types of contracts, proposal preparation, evaluating contracts, negotiating contracts, determining allowable costs, contract auditing, renegotiation, contract extension policies and procedures, appraisal of capabilities of contractors.

207 *Personnel Administration* (3) Lindberg, Cronin
Fall—evening; spring—evening. Study of personnel functions with emphasis on relationships within organizations which utilize the services of engineers and scientists:

employment, health, safety, education and training, financial compensation, union relations, collateral benefits and services, human relations and personnel research practices in engineering and industry.

210 *Engineering Law* (3)

Spring—evening. Legal principles and procedures of interest to engineers, the American Legal System, contracts and specifications, liability of professional engineers, antitrust problems, agency relationships, negotiable instruments, patent and proprietary rights, special problems in research and development contracts.

253 *Management of Production Processes and Facilities* (3) Smith

Fall—evening; spring—evening. Planning, organizing, and control of production; forecasting techniques; material management; methods of loading and scheduling production processes; electronic methods in production control. Organization and administration of the plant engineering function with emphasis on maintenance control programs.

254 *Principles and Procedures of Automatic Data Processing Systems* (3)

Fall—evening; spring—evening. Logic of computers, arithmetic and control units, computers as systems analysis for data processing applications, systems design, systems economics, relation to scientific decision processes.

255 *Administration of Research and Development* (3) Lindberg

Fall—evening; spring—evening. Contemporary practices of administrators of scientific and engineering research and development for the purpose of finding uniformities, characteristics, and conceptual schemes; relation of such findings to accepted managerial concepts, and projection of their implications on contemporary managerial hierarchies and organizational structures.

261 *Economic Analysis in Engineering Planning* (3) Lindberg

Fall—evening; spring—evening. Important concepts and theories employed in economic analysis of engineering projects. Application of tools and techniques used in various analytic processes. Detailed practice in pursuit of solutions to, and adjustment of, persistent and current problems in this field.

263 *Quantitative Techniques of Engineering Administration* (3) Glaser

Spring—evening. Application of the various quantitative techniques, mathematical, statistical, and other management sciences' techniques to the analysis of engineering administration and the solution of administrative problems by the use of models, theories, and measurements.

271 *Operations Research* (3) Kaye, Webb

Fall—evening; spring—evening. Background and application of operations research; history, characteristics, capabilities, administrative considerations, methods, and techniques, including construction of conceptual and mathematical models. Prerequisite: Mathematics 31 or 24, Statistics 107, or permission of the instructor.

272 *Problems in Operations Research* (3) Kaye

Spring—evening. Field experience in operations research on a team basis. Each small group locates an actual problem and formulates and solves it by operations research methods. Class evaluation of progress. Prerequisite: Engineering Administration 271.

275 *Linear Programming* (3)

Fall—evening; spring—evening. The basic computational, theoretical, and applied areas with emphasis on the general linear programming problem; simplex computational procedure; duality; transportation and assignment problems; production scheduling problem; zero-sum two person games; and additional applications and recent developments. Prerequisite: Engineering Administration 271.

276 *Theory of Games* (3)

Fall—evening. Study of mathematical models with applications to the relationships among independent competitive entities (persons or organizations in environment of

competition, bargaining, bidding), selection of optimum strategies, mixed strategies, minimax concept, connections with linear programming and decision functions, two-person and n-person zero and nonzero sum games. Prerequisite: Engineering Administration 271.

277 *Queuing Theory* (3)
Spring—evening. Study and analysis of operational systems with variables in arrivals and service, Monte Carlo analysis, optimization methods. Prerequisite: Engineering Administration 271.

285 *Seminar in Administrative Problems* (3) Smith
Fall—evening; spring—evening. Individual analysis of complex administrative problems, with group evaluation and discussion. Prerequisite: admission to candidacy and completion of at least 18 semester hours of graduate study.

295 *Applied Research in Engineering Administration* (arr.) Smith, Lindberg
Fall—as arranged. Application of established principles to new engineering administrative situations; the development of new knowledge of administration. Prerequisite: approval of the instructor.

296 *Research in Engineering Administration* (arr.)
Fall—as arranged; spring—as arranged. Creative thinking in engineering administration, initiation of new theories and principles, development of new hypotheses, experimentation, proof of theories and hypotheses. Prerequisite: approval of the instructor.

299–300 *Thesis* (3–3)
Academic year—as arranged.

Engineering Science

Second Group

The following courses serve as foundations for specialization, since they are concerned with a body of knowledge applicable in a variety of engineering fields.

130 *Introductory Astronomy* (3) Grisamore
Spring—evening. Coordinate systems and nomenclature used in astronomy, description of astronomical systems from solar system to metagalaxies, introduction to celestial mechanics, types of stars, stellar physics. Prerequisites: integral calculus and one year of college physics.

154 *Automatic Control** (4) Crafton, dePian
Spring—day and evening. Theory of automatic control systems including electromechanical, pneumatic, and hydraulic systems. Transient analysis, transfer functions, stability criteria. Experimental study of automatic control systems. Lecture and laboratory. Prerequisite: Electrical Engineering 127 or Mechanical Engineering 123. Laboratory fee, $11.

Third Group

201 *Automatic Control* (3) Crafton
Fall—evening. Advanced theory of automatic control. Systems analysis, multiple-loop systems, nonlinear systems.

211 *Mathematical Methods in Engineering I* (3) Arkilic, Braun
Fall—day and evening; spring—evening. A course in such topics as functions of complex variables, infinite series, linear vector spaces and matrices, and partial differential equations. The required level of preparation is equivalent to Mathematics 111 and 112 as given at this University.

212 *Mathematical Methods in Engineering II* (3) Arkilic, Braun
Fall—evening; spring—evening. Continuation of Engineering Science 211. Mathematical topics include: introduction to tensor analysis, calculus of variations, finite differences, and integral equations.

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

216 ***Advanced Dynamics*** (3) **Crafton**
Time to be arranged. Dynamics of continuous mechanical systems; Lagrange's equations, Hamilton's principle, gyrodynamics; operational methods. Prerequisite: permission of the instructor.

217 ***Analytical Mechanics*** (3) **Crafton**
Fall—evening; spring—evening. Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations.

218 ***Mechanics of Orbits and Trajectories*** (3) **Crafton**
1962–63 and alternate years: fall—evening. Celestial mechanics. Orbits and trajectories in force fields. Dynamics of space vehicles.

219 ***Mechanics of Continua*** (3) **Arkilic**
Time to be arranged. Mechanics of elastic, plastic, and vicous solids and of fluids; introduction to theory and formulation of basic equations.

220 ***Nonlinear Mechanics*** (3) **Crafton**
Spring—evening. Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations.

221 ***Theory of Elasticity I*** (3) **Arkilic**
Spring—evening. Introduction to mathematical theory of elasticity, analysis of strain and stress, generalized Hooke's law, equilibrium equations, Beltrami-Michell equations, strain energy functions, torsion, general flexure.

222 ***Theory of Elasticity II*** (3) **Arkilic**
1962–63 and alternate years: fall—evening. First and second boundary-value problems in plane elasticity, uniqueness of solutions, simply and multiply connected regions, three dimensional problems, thermoelasticity, vibration of elastic solids, variational methods.

223 ***Celestial Mechanics*** (3) **Crafton**
Time to be arranged. General equations of motion; Lagrange's planetary equations; disturbing function; Delaunay and Poincaré variables; secular inequalities; lunar theory; precession and nutation.

227 ***Experimental Stress Analysis*** (3) **Walther**
Time to be arranged. Applications of the theory of elasticity in the analysis of strain and stress; theory of gaging for static and dynamic strain and stress measurements.

230 ***Dynamics of Compressible Fluids*** (3) **Ojalvo**
Time to be arranged. Mathematical theory of compressible fluid flow and thermodynamics of compressible fluids. Prerequisite: permission of the instructor.

231 ***Fluid Dynamics*** (3) **Ojalvo**
Fall—evening. Theory of compressible and incompressible fluid motion including potential motion, circulation and vorticity, mathematical treatment of flow at sub-, trans-, and supersonic velocities, normal and oblique shock, and elements of heat transfer.

233 ***Engineering Problems*** (3) **dePian**
Spring—evening. Investigation of problems in engineering science, emphasizing imaginative and systematic application of fundamental principles in engineering, physics, and mathematics.

241 ***Science of Engineering Materials*** (3) **Murdaugh**
1963–64 and alternate years: fall—evening. Relation of the atomic and microscopic structure of engineering materials to their physical and mechanical properties and their mechanical behavior in engineering applications.

251 ***Magnetohydrodynamics*** (3) **Grisamore**
Time to be arranged. Study of the interaction of electromagnetic and fluid fields. Dynamics of conducting fluids in electromagnetic and magnetic fields.

299–300 *Thesis* (3–3)
Academic year—as arranged.

Mechanical Engineering

First Group

9 *Introduction to Engineering** (3) — The Staff
Fall—day and evening; spring—evening. Number systems, computation aids, scientific method, problem solving techniques, use of mathematical tables. Emphasis is placed on the development of sound reasoning and study methods.

10 *Graphical Communication* (2) — The Staff
Fall—evening; spring—day and evening. Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course. Laboratory fee, $10.

Second Group

100 *Analytical Kinematics* (3) — O'Neale
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Theoretical study of the motion of constrained and unconstrained rigid bodies. Prerequisite or concurrent registration: Civil Engineering 121, Mathematics 112.

113 *Thermodynamics I* (3) — Dedrick
Fall—day and evening. Theoretical study of fundamental concepts, equations of state, first and second laws of thermodynamics, entropy, single and two-phase mixtures. Prerequisite: Chemistry 12 or 14, Mathematics 111, Physics 16.

114 *Thermodynamics II* (3) — Ojalvo, Dedrick
Spring—day. Theoretical study of vapor cycles, combustion, gas dynamics, equilibrium, multiphase mixtures. Prerequisite: Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132, Mechanical Engineering 118.

118 *Heat Transfer* (3) — Ojalvo, Dedrick
Spring—day and evening. Heat transfer theory, conduction, convection, radiation, field and potential theory applied to conduction. Prerequisite: Mathematics 112, Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132.

120 *Physical Metallurgy* (3) — Murdaugh
1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Physics of metals, crystal and lattice structures, binary and ternary alloys, properties of alloys, nonequilibrium conditions, phase diagrams. Lecture and laboratory. Prerequisite: Civil Engineering 125, Mathematics 31 or 24. Laboratory fee, $10.

123 *Advanced Dynamics I* (3) — Crafton
1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Shock and vibrations in linear mechanical systems, electromechanical analogies, transient and steady-state analysis. Prerequisite: Mechanical Engineering 100. Prerequisite or concurrent registration: Civil Engineering 157.

124 *Advanced Dynamics II* (3) — Crafton
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Advanced study of dynamics of continuous mechanical systems. Lagrange's equations, Hamilton's principle, gyrodynamics. Prerequisite: Mechanical Engineering 123.

135–36 *Thermal Power* (3–3) — Ojalvo
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Analysis and design principles governing systems and components in heat power, gas and vapor turbines, internal combustion engines, heat pumps, nuclear power systems. Lecture and laboratory. Prerequisite: Civil Engineering 132; Mechanical Engineering 114, 118; Physics 191. Prerequisite or concurrent registration: Mechanical Engineering 139. Laboratory fee, $15 a semester.

* This course should be completed before the beginning of the sophomore year.

139 *Fluid Machinery* (3) **Dedrick**

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. General theory of dynamic machines; velocity diagrams and work transfer; radial, axial, and mixed-flow machines; torque converters and couplings; jet machines. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Prerequisite or concurrent registration: Mechanical Engineering 123. Laboratory fee, $10.

143 *Production Analysis* (3) **Kaye**

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Principles of schematic models, mathematical programming, quality control, operations analysis. Prerequisite: Mathematics 112.

146 *Dynamics of Compressible Fluids* (3) **Dedrick**

1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Mathematical theory of compressible fluid flow, flow around immersed bodies, airfoil theory, shock wave theory, thermodynamics of compressible fluids. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 118. Laboratory fee, $10.

195–96 *Special Topics in Mechanical Engineering* (arr.)

Academic year—as arranged. Special problems approved by the Staff. May be substituted for required senior courses. Prerequisite: senior status and approval of the instructor.

THIRD GROUP

211 *Thermodynamics* (3) **Ojalvo**

Fall—evening. Reversible and irreversible processes, equilibrium, ideal and van der Waal's gases, dilute solutions, phase equilibria, electric and magnetic effects, radiation. Introduction to kinetic theory and statistical mechanics.

213 *Heat Transfer* (3) **Ojalvo**

Spring—evening. Physical and mathematical concepts of heat transfer phenomena under steady and unsteady conditions, including: Stefan-Boltzmann and Planck laws for radiation, Fourier heat equation for conduction, dimensional analysis, and boundary layer theory for convection.

215 *Gas Dynamics* (3) **Ojalvo**

Spring—evening. Theory of gas dynamics including: combustion, shock phenomena, dynamics of flow, and heat transfer for high temperature gases.

235 *Hypersonic Fluid Dynamics* (3)

Time to be arranged. Small disturbance theory; Newtonian theory; constant-density solutions; thin shock layers; viscous interactions; free molecule and rarefied gas flows.

255 *Combustion Processes* (3) **Dedrick**

Time to be arranged. Thermodynamics of combustion; chemical kinetics; flame propagation; combustion of liquids and solids; detonation processes.

256 *Reaction Kinetics* (3) **Dedrick**

Time to be arranged. Theoretical aspects of kinetics of homogeneous and heterogeneous reactions in gaseous and liquid systems.

Metrology*

FIRST GROUP

4 *Introduction to Statistics for Metrology* (3) **McNish**

Measurement—qualitative and quantitative aspects. The role of corrections. Measurement as a production process. Errors, limiting mean, true value, precision, and accuracy. Classification of errors; statistical tools for the detection and diagnosis of errors. Quality control of measurement processes. Measurement of the precision and assessment of the accuracy of a measurement process. Expression of the uncertainties

* NBS in parentheses indicates courses which will be taught at the National Bureau of Standards.

affecting a measured value. Prerequisite: Mathematics 31 or 24, and a laboratory course in physical science or engineering.

5–6 *Foundations of Metrology I–II* (5–4) (NBS) McNish
Origin and development of standards, relative and absolute measurements, systematic and random errors, comparison and dissemination of standards, effective design of experiments, translation of standards to manufacturing. Use of standard devices for measurement of length, time, speed, force, weight, mass, density, specific gravity; calibrations. Fluid flow and electrical measurements; measurements involving use of several instruments. Prerequisite: Mathematics 31 or 24, Physics 14.

SECOND GROUP

111–12 *Precise Electrical Measurements I–II* (3–3) (NBS) Harris
Electrical measurements from direct current through radio frequencies. Units and dimensional systems; techniques of substitution and comparison; transfer techniques; ratio techniques; detectors; bridges; measurement of current, voltage, power, resistance, capacitance, inductance, energy, phase angle, frequency, and time; dielectric and magnetic measurements; special topics in high-frequency measurements; field strength, signal-to-noise ratio, impedance, attenuation. Prerequisite: Electrical Engineering 102, 104, and Mathematics 111, or the equivalent.

113 *Introduction to Transducers and Instrumentation* (2) Moore
Theory and application of simple transducers; techniques in instrumentation of systems of one type (electrical, electronic, fluid, mechanical, optical, acoustical, nuclear); analysis and design of simple instrumentation systems, with emphasis on the precision and accuracy of measurement. Prerequisite: Electrical Engineering 102, Mathematics 111, Metrology 6, or the equivalent.

114 *Advanced Transducers and Instrumentation* (3) Moore
Advanced study of practical transducers and instrumentation; theory and applications of advanced transducers in instrumentation problems involving measurements on systems containing multiple quantities of one type or mixture of types (such as electrical, electrical-electronic, fluid, fluid-mechanical-acoustical, etc.), with emphasis on optimal instrumentation for precision measurement. Prerequisite: Metrology 113 or graduate status.

121 *Precise Mechanical Measurements* (4) (NBS) Young
Measurements of mass, time, weight; visual, mechanical, length, and interferometric methods; density, force, pressure, vibration, acceleration, flow, and viscosity measurements. Prerequisite: Metrology 4, 5, or the equivalent.

131 *Precise Heat Measurements* (4) (NBS) Guildner
Temperature measurement, the thermodynamic and international temperature scales; resistance thermometry, thermocouples, and pyrometry. Vapor pressure thermometry and other techniques for low-temperature measurement. Heat transfer quantities and their measurement, conduction, convection, and radiation. Calorimetry; isothermal and adiabatic calorimeters, flow calorimeters; types of heat quantities measured by calorimetry. Prerequisite: Metrology 4, 5, 111, or the equivalent.

THIRD GROUP

201 *Advanced General Metrology* (3) McNish

203–4 *Probability and Statistics of Metrology I–II* (3–3) Eisenhart
Probability distributions, discrete and continuous distributions; sampling; combinational analysis; stochastic processes; conditional probability; correlation; analysis of variance; design and analysis of experiments, Latin Square experiments, factorial experiments, block and lattice designs. Prerequisite: Metrology 4 or the equivalent and graduate status.

214 *Microwave Measurements* (3) Sorger
Measurement of power, frequency, impedance, wavelength, and attenuation at microwave frequencies. Characteristics and Q of resonant devices. Prerequisite: Electrical Engineering 104 or the equivalent and graduate status.

220 *Precise Optical Measurements* (3) _____
Optical constants of lens systems; aberration; resolving power; illumination in focal plane; image evaluations, magnification, index of refraction; color and color temperature.

ENGLISH*

Professors E. S. Shepard, F. S. Tupper, C. D. Linton, C. W. Cole *(Chairman)*, R. H. Moore, J. H. Coberly, P. H. Highfill, Jr.
Associate Professors W. L. Turner, Muriel McClanahan, J. G. Allee, Jr., J. P. Reesing, Jr., R. H. Walker, Jr.
Assistant Professors R. E. Gajdusek, Elizabeth Wright, Nancy Tischler, J. G. Sweeney, M. E. Lyon
Instructors Jane Bauman, R. C. Rutledge, E. N. Harbert

Bachelor of Arts with a major in American Thought and Civilization (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, pages 52–53.

Required: the general requirements, pages 58–62, and the grade "pass" on the American Thought and Civilization major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined is summarized under four general headings: (1) European cultural history—the Renaissance and modern social and intellectual cultures as a background to contemporary civilization with particular attention to English literature and history from the 16th through the 19th centuries; (2) American history—the political, economic, social, and religious thought and experience of the American people; (3) American philosophy and fine arts—a survey of periods and movements with a knowledge of outstanding individuals; (4) American literature—a knowledge of major writers, together with a study of poetry, fiction, and drama. The Department of English provides a proseminar (English 179–80) intended to assist the student in preparing himself for the major examination. The major adviser will give to each student at registration a check list of available courses grouped as prerequisite, necessary, or desirable for the completion of the major study program.

Bachelor of Arts with a major in English Literature (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, pages 52–53. It is recommended that prospective majors elect English 91–92 from among the listed offerings.

Required: the general requirements, pages 58–62, and the passing of the English Literature major examination at the end of the senior year. The field of coordinated knowledge upon which the student will be examined at the end of his senior year is summarized under the following general headings: (1) the history of English literature from the Anglo-Saxon period; (2) the chief English writers (a certain familiarity with each man and his main works and a detailed knowledge of Shakespeare); (3) English social and political history as it bears upon or is reflected in the literature; (4) European intellectual backgrounds and movements which have affected English literature. The proportion of work taken in each of these areas should be worked out by the student in consultation with one of the English Literature advisers. The Department of English provides a proseminar (English 199–200) to assist the student in preparing himself for the major examination. A detailed description of the major is available in the Office of the Dean of Columbian College.

Master of Arts in the field of American Literary and Cultural History.—Prerequisite: the equivalent of an undergraduate major in this University in (1) History (with American history as a major part), (2) American Thought and Civilization, or (3) English

*The Staff of Instruction here listed is for the academic year 1961–62.

Literature (with introductory courses in American literature and American history). The student who has not taken any of the above majors at this University must take a candidacy examination.

Required: in addition to the general requirements, pages 64–66, the following specific requirements must be met: twelve of the required semester hours must be of seminar study, six in American history and six in American literature; twelve of the required semester hours must be of second and third group courses in the fields of American history, literature, philosophy, education, and art recommended by the adviser; a thesis (six semester hours) in any of the foregoing fields or in some combination of them. Because of the various undergraduate majors which will be accepted for admission to this program, a basic reading list is assigned to all students, to assist in preparing them for the final Master's examination.

Master of Arts in the field of English and American Literature.—Prerequisite: an undergraduate major in English Literature or American Thought and Civilization at this University; or twenty-four semester hours in English and/or American literature above the sophomore level. The student who has not taken either of the above majors at this University must take a candidacy examination. The student offering split preparation (English and American literature) will be examined in English and American literature.

Required: in addition to the general requirements, pages 64–66, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; on the basis of the student's undergraduate preparation, to include a comprehensive survey of American literature and of English literature from 1600; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the major portion of the material falls; (3) a final written examination on American literature and on English literature from 1600.

Master of Arts in the field of English Literature.—Prerequisite: an undergraduate major in English Literature at this University, or twenty-four semester hours in English literature above the sophomore level. The student who has not passed the major examination in English at this University must take a candidacy examination which, in its scope and difficulty, is comparable to the major examination in English.

Required: in addition to the general requirements, pages 64–66, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the material falls; and (3) a final written examination.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Arts in Education with a teaching field in English.—Prerequisite: the Education curriculum, pages 54–55.

Required: the English option and the professional courses listed in the School of Education Catalogue.

ENGLISH COMPOSITION*

First Group

A *English for Foreign Students* (3) — Allee and Staff

Fall—day and evening; spring—day and evening; summer 1962. A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B *English for Foreign Students* (3) — Allee and Staff

Fall—evening; spring—day and evening. For second-semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

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* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

All students enrolled in curricula leading to Bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.

English 1 or 1X is prerequisite to all other courses in English. English 2 is the second half of the six-hour composition course requirement of students *not* required to follow the Columbian College of Arts and Sciences sequence.

1 *English Composition** (3) — Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. Review of grammar, exercises in composition, readings.

1X *English Composition** (3) — Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is $115 (the regular fee of $30 a semester hour, plus an additional fee of $25).

2 *English Composition** (3) — Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. For second-semester freshmen not following the Columbian College of Arts and Sciences sequence. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X.

4 *English Composition** (3) — Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. The second half of the six-hour English Composition course required of students in Columbian College. A course in critical analysis and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X and both semesters of one of the introductory literature courses.

11 *The Writing of Reports* (3) — Turner and Staff
Fall—day and evening; spring—day and evening; summer 1962. Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X, and 2 or 4.

Second Group

109 *Expository Writing* (3) — McClanahan and Staff
Fall—evening. A study of types of expository writing with weekly exercises. Prerequisite: English 1 or 1X, and 2 or 4.

113 *Narrative Writing* (3) — Gajdusek
Fall—evening. Study of the techniques of narrative writing and class criticism of student writing. Prerequisite: English 1 or 1X, and 2 or 4.

114 *The Writing of Fiction—the Short Story* (3) — Gajdusek
Spring—evening. Prerequisite: English 113; consent of instructor.

116 *Advanced Exposition* (3) — Moore
Not offered 1962–63. Theory and practice in the writing of expository articles and essays. Prerequisite: English 109; consent of instructor.

117–18 *The Writing of Fiction—the Novel* (3–3) — Gajdusek
Academic year—evening. Writing a novel. Prerequisite: English 114; consent of instructor.

ENGLISH LITERATURE

First Group

51–52 *Introduction to English Literature*† (3–3) — Tupper and Staff
Academic year—day and evening; summer 1962. A historical survey. Prerequisite: English 1 or 1X.

* See footnote on page 222.
† See footnote on page 224.

91–92 *Introduction to European Literature** (3–3) Shepard and Staff
Academic year—day and evening. Consideration of various types. Prerequisite: English 1 or 1X.

SECOND GROUP*

121–22 *English Literature from the Beginnings to 1500* (3–3) Allee
First half: not offered 1962–63. *Second half:* spring—evening; summer 1962. *First half:* English literature prior to Chaucer. *Second half:* Chaucer.

125 *Introduction to English Linguistics* (3) Allee
Fall—evening. The development of the English language in a historical treatment of English grammar.

129–30 *Elizabethan Nondramatic Literature* (3–3) Tupper
Academic year—day. Nondramatic literature from 1485 to 1601.

135–36 *Shakespeare* (3–3) Tupper
Academic year—day.

139–40 *The Seventeenth Century* (3–3) Linton, Reesing
Academic year—evening; summer 1962—English 139 (3). *First half:* poetry and prose from 1603 to 1660. *Second half:* Milton.

141–42 *The Neoclassical Movement* (3–3) Highfill
Academic year—day. Poetry and prose from 1660 through the mid-18th century.

151–52 *The Romantic Movement* (3–3) Reesing
Not offered 1962–63. From the mid-18th century through Shelley and Keats.

161–62 *Victorian Literature* (3–3) Shepard
Academic year—day. Poetry and prose from 1830 to 1900.

165–66 *The Twentieth Century* (3–3) Linton
Academic year—day; summer 1962—English 166 (3). British poetry, prose, and drama since 1900.

181–82 *The English Novel* (3–3) Reesing
Academic year—day. Major English novelists from the 18th century to the present day.

183–84 *The English Drama* (3–3) Highfill
Academic year—evening. *First half:* concerned principally with the drama of Shakespeare's contemporaries. *Second half:* a historical survey from 1660 to the present day.

192 *Medieval Legend and Saga* (3) Allee
Not offered 1962–63. Celtic and Norse.

199–200 *Proseminar: Readings for the English Literature Major* (3–3) Tupper, Highfill
Academic year—day and evening. Conferences and group discussions.

THIRD GROUP

222 *The Age of Chaucer* (3)
Not offered 1962–63.

223–24 *Old English* (3–3) Allee
Academic year—evening. English language and literature before 1100. *First half:* Old English grammar and readings. *Second half:* Beowulf.

* All students enrolled in curricula leading to Bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.
English 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second-group courses except English 125.

225 *Applied Linguistics* (3) Allee
Not offered 1962–63. Survey of the English language since 1850; introduction to analytical methods of structural linguistics and their application to modern American and British writing and to secondary school teaching of English.

235–36 *Studies in Shakespeare and His Contemporaries* (3–3) Tupper
Summer 1962—English 236 (3). Prerequisite: English 135–36.

239–40 *Studies in Seventeenth Century Literature* (3–3) Reesing
Not offered 1962–63. Open to qualified undergraduates. *First half:* chief figures exclusive of Milton. *Second half:* Milton.

241–42 *Studies in Neoclassical Literature* (3–3) Highfill
Not offered 1962–63. Prerequisite: English 141–42.

251–52 *Studies in the Romantic Movement* (3–3) Reesing
Not offered 1962–63. Prerequisite: English 151–52.

261–62 *Studies in Victorian Literature* (3–3) Shepard
Not offered 1962–63. Prerequisite: English 161–62.

265–66 *Studies in Twentieth Century Literature* (3–3) Linton
Not offered 1962–63. Eliot and his contemporaries.

295–96 *Studies in the History of English Literary Criticism* (3–3) Shepard
Academic year—evening. Open to undergraduates with the approval of the instructor.

299–300 *Thesis* (3–3) The Staff

AMERICAN LITERATURE

First Group

71–72 *Introduction to American Literature** (3–3) Cole and Staff
Academic year—day and evening; summer 1962. A historical survey. *First half:* from the beginnings to the Civil War. *Second half:* from the Civil War to the present. Prerequisite: English 1 or 1X.

Second Group*

170 *The American Short Story* (3) Coberly
Fall—day. The historical development of the short story in America.

171–72 *Studies in American Literature* (3–3) Lyon
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Major factors in the national cultural tradition as shown by outstanding writers. Prerequisite: English 51–52 or 71–72.

173–74 *Major American Poets* (3–3) Coberly
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening; summer 1962—English 174 (3). Advanced critical study of significant writers and movements. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

175–76 *American Drama* (3–3) Cole
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—English 176 (3). Historical and critical study of significant plays and forms. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

* All students enrolled in curricula leading to Bachelor's degrees in Columbian College who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.
English 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second-group courses except English 171–72.

177–78 *American Fiction* (3–3) Coberly
1962-63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Historical and critical study of significant novels and short stories. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

179–80 *Proseminar: Readings for American Thought and Civilization Majors* (3–3) The Staff
Academic year—day and evening. Conferences and group discussions.

THIRD GROUP

271–72 *Seminar in American Thought* (3–3) Walker
Not offered 1962-63. Intensive consideration of specific periods and themes, primarily literary, in the history of American civilization. Prerequisite: English 171–72 or the equivalent.

277–78 *Studies in American Fiction* (3–3) Coberly
First half: fall—evening. *Second half:* not offered 1962–63. Prerequisite: English 177–78 or the equivalent. Open to the undergraduate with the approval of the instructor.

279–80 *Thesis* (3–3) The Staff

RELATED COURSES IN OTHER DEPARTMENTS

Education 136, *Teaching English*
History 151–52, *English History*
Philosophy 111–12, *History of Philosophy*
Speech B, *American Speech for Foreign Students*
Speech 102, *Oral Interpretation of Literature*

GEOGRAPHY*

Professor R. D. Campbell *(Chairman)*
Associate Professor H. W. Westermann†
Associate Professorial Lecturer J. P. Pickard
Assistant Professor J. T. Davis
Associate Joan Barry

Bachelor of Arts with a major in Geography (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including Geography 51 and 52. It is strongly recommended that this curriculum include Biology 1–2‡; Economics 1–2; Geology 1–2; and Sociology and Anthropology 1–2.

Required: in addition to the general requirements, pages 58–62, twenty-four semester hours of Geography beyond first-group courses, including Geography 103–4, 115–16; fifteen semester hours in one or more of the following departments: Botany, Economics, Geology, History, Political Science, Psychology, Sociology and Anthropology; and six semester hours of Mathematics or Statistics.

Master of Arts in the field of Geography.—Prerequisite: the degree of Bachelor of Arts with a major in Geography from this University, or the equivalent.

Required: the general requirements, pages 64–66, including Geography 201–2, 205–6, and 299–300.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On sabbatical leave fall semester 1961–62.
‡ An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Science in Cartography.—See pages 229–30, "Courses Offered in Special Programs," and the College of General Studies Catalogue for complete details.

Bachelor of Arts in Education with a teaching field of Geography.—Prerequisite: the Education curriculum, pages 54–55.

Required: the Geography option and the professional courses listed in the School of Education Catalogue.

First Group

51 *Introduction to Geography* (3) — The Staff

Fall—day; spring—evening; summer 1962. A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

52 *World Regions* (3) — The Staff

Fall—evening; spring—day; summer 1962. The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.

Second Group

103–4 *Cartography* (3–3) — The Staff

A year course: credit is not given for the first half until the second half is completed. Academic year—Saturday morning. Principles of cartographic drafting; elementary map projections; map and graph planning design and construction; uses and interpretation of maps. Prerequisite: Geography 51 and 52. Laboratory fee, $11 a semester.

115–16 *Physical Geography* (3–3) — Davis

Academic year: lecture (2 hours), laboratory and field trip (2 hours)—day. Introduction to the earth sciences: form of the earth, grids and time, weather and climate, geomorphic processes and land-forms, soils, vegetation; weather forecasting, map reading.

124 *Land Capabilities* (3)

1963–64 and alternate years. Evaluation of land capabilities based on analysis of locational, physical, economic, and social land characteristics. Principles of site analysis and best use. Systems of measurement of area potential.

125 *Transportation Complexes* (3)

1963–64 and alternate years. A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.

126 *World Economies* (3) — Davis

1962–63 and alternate years: fall—day. Description and comparison of differing regional economies—pastoral, agricultural, industrial; patterns of world distribution.

127 *World Population and Settlement* (3) — Westermann

1962–63 and alternate years: spring—day. Population composition, structures, and distribution; characteristic world settlement patterns in terms of population organization. Assessment of factors contributing to population pressures, explosions and migrations, urban and rural settlement patterns and trends.

133 *Regional Industrial Structures* (3) — Westermann

1962–63 and alternate years: fall—day. The nature of the industrial complex, types and distribution of industry, principles of industrial and economic development planning.

134 *Location of Industry* (3) — Westermann

1962–63 and alternate years: spring—day. Structure and development of the major world industries, industrial location requirements, principles of industrial equilibrium.

137 *Industrial Planning for Underdeveloped Areas* (3)

Summer 1962. The appraisal of industrial development potentials in non-industrial areas; the preparation and implementation of industrial development plans; peculiar

problems of industrial development in traditional societies; the role of industrialized countries, with particular emphasis on United States responsibilities.

141–42 *Urban Settlement* (3–3)
1963–64 and alternate years. Location, functions, and forms of cities; urban-rural relationships; the urban hierarchy; urban problems and the history of their development; the city of the future.

145 *World Cultural Geography* (3) Campbell
Fall—day. A study of differences in national character structures; modal behavior patterns and personality traits typical of various cultures; difficulties these differences present in interpersonal relations and intercultural communications.

146 *World Political Geography* (3) Campbell
Spring—day. Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.

173–74 *City Planning: Theory and Practice* (3–3) ———
Academic year—evening. Theories of city functions and structures; evaluation of urban activities, value systems; analysis of contemporary urban problems; optimum designs for future cities; theory and techniques of planning; action techniques; implementation of plans.

181 *United States** (3)
Not offered 1962–63.

183 *Western Europe** (3) Westermann
1962–63 and alternate years: fall—day.

184 *The Mediterranean** (3) Westermann
1962–63 and alternate years: spring—day.

185 *Africa** (3)
Offered 1963–64.

186 *The Middle East** (3)
Offered 1963–64.

191 *Latin America** (3)
1963–64 and alternate years.

194 *Communist China** (3) Davis
Spring—day.

195 *Eastern and Southeastern Asia** (3)
Not offered 1962–63.

196 *The Soviet Union** (3) Westermann
Fall—day.

197 *The Pacific** (3)
Not offered 1962–63.

198 *Australia** (3)
Not offered 1962–63.

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* Regional survey. No prerequisites. For students particularly interested in the study of specific regions, regional courses in the departments of Economics, History, and Political Science are strongly recommended, for example: Economics 185–86, *Economic History and Problems of Latin America*; History 164, *South America since Independence*; and Political Science 177, *Recent Trends in Latin American Politics and Government*.

Third Group*

201–2 *Seminar: History and Philosophy of Geography* (3–3) — Campbell, Westermann

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening. A study of the development of geographic thought, from Herodotus to the present; a critical appraisal of the great works of the world's most famous geographers; an attempt to develop a useful, contemporary philosophy of geography.

205–6 *Area Data Collection and Analysis* (3–3)

A year course: credit is not given for the first half until the second half is completed. Lecture (1 hour), laboratory and field (3 hours). 1963–64 and alternate years. Sources of regional information; methods and systems of data collection; quantitative and qualitative methods of analysis; systems of synthesis.

211–12 *Reading Course in Economic Geography* (3–3)

Not offered 1962–63. The development of economic geography as a systematic approach to regional analysis, the literature of economic geography, research methods.

233–34 *Seminar: Regional and Urban Planning* (3–3) — Westermann, Campbell

A year course: credit is not given for the first half until the second half is completed. Academic year—evening. Analysis of the planning function, major problems confronting the planner, contemporary status of planning—its areas of success and failure.

241–42 *Seminar: Place and Culture* (3–3)

1963–64 and alternate years. A study of the culture traits which characterize various ethnic groups and differentiate people-place associations.

251–52 *Seminar: World Problem Areas* (3–3)

Summer 1962—Geography 251 (3). A study of those parts of the world which have become matters of international concern, whether because of their political or social instability, unsound economic development, or aggressive tendencies. An evaluation of the complex of factors which have created the "problems".

295–96 *Research* (3–3) — The Staff

Academic year—as arranged.

299–300 *Thesis* (3–3) — The Staff

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following courses for students undertaking work toward the degree of Bachelor of Science in Cartography, which is administered by the College of General Studies. For information concerning the degree in Cartography, see the brochure on the subject.

Cartography Program

Geography

51 *Introduction to Geography* (3)

52 *World Regions* (3)

115–16 *Physical Geography* (3–3)

124 *Land Capabilities* (3)

125 *Transportation Complexes* (3)

* Senior, major or graduate status is required in all third-group courses.

CARTOGRAPHY

1 *Map Interpretation* (3)
11 *Cartographic Drafting and Descriptive Geometry* (3)
12 *Topographic Surveying* (3)
13 *Higher Surveying* (3)
17–18 *Elementary Photogrammetry* (3–3)
110 *Map Projections* (2)
111 *Map Reproduction* (3)
155 *Elementary Geodesy* (3)
156 *Geodetic Astronomy* (3)
160 *Theory of Errors and Geodetic Adjustments* (3)
191–92 *Map and Chart Construction* (3–3)

OCEANOGRAPHY

101–2 *Introductory Oceanography* (3–3)

GEOLOGY*

Professor Geza Teleki *(Chairman)*
Professorial Lecturers G. L. Christ, Michael Fleischer, H. T. Evans, Jr., I. G. Sohn
Associate Professor G. V. Carroll
Associate Professorial Lecturer Nicholas Hotton
Lecturer Irving Friedman

Bachelor of Arts or *Bachelor of Science with major in Geology (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53. The following first-group courses must be included: Geology 1–2, 12; Chemistry 11–12; Physics 11, 12; Mathematics 6, 21, or 12.

Required: in addition to the general requirements, pages 58–62, twenty-seven semester hours in Geology beyond first-group courses for the Bachelor of Arts degree, thirty three for the Bachelor of Science degree.

Master of Arts or *Master of Science in the field of Geology.*—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respctively, with a major in Geology from this University, or the equivalent.

Required: the general requirements, pages 64–66. For graduate work, the foreign language studied should be French, German, or Russian.

FIRST GROUP

1–2 *Introductory Geology* (3–3) The Staff

Academic year: lecture (2 hours), laboratory and field trip (2 hours)—day. A survey course covering the principles of geology. *First half:* physical geology—materials of the earth's crust, geologic processes. *Second half:* historical geology—geological periods, evolution of life on earth. Laboratory fee, $6 a semester.

12 *Minerals and Rocks* (3) Carroll

Spring: lecture (2 hours), laboratory (3 hours)—day. Introduction to the common minerals and rocks and their environments; identification of minerals by determination of their physical properties and by the use of elementary chemical tests. Prerequisite: Geology 1. Laboratory fee, $8.

* The Staff of Instruction here listed is for the academic year 1961–62.

Second Group

101 *History of Geological Sciences* (2) — Teleki

Not offered 1962–63. Lectures on the development of geological thought and the history of geological and related sciences.

107 *Dynamic Geology* (3) — Teleki

Fall: lecture (3 hours), recitation (1 hour)—day. The interrelation of endogene and exogene forces in the processes of sedimentation and vulcanism; geochemical and geophysical aspects of epicontinental and geosynclinal areas. Prerequisite: Geology 1–2, 12; Physics 11, 12.

111–12 *Mineralogy* (3–3) — Carroll

A year course: credit is not given for the first half until the second half has been completed (except for chemistry majors who may receive credit for the first half only). Academic year: lecture (2 hours), laboratory (3 hours)—evening. *First half:* morphological crystallography and elementary aspects of optical crystallography with their application to the identification of minerals. *Second half:* optical mineralogy; identification of nonopaque minerals by use of the polarizing microscope. Prerequisite: Geology 1 and 12; Physics 11, 12, or permission of the instructor. Laboratory fee, $10 a semester.

115 *Petrography* (4) — Carroll

Fall: lecture (2 hours), laboratory (4 hours)—evening. Megascopic and microscopic identification and classification of common rocks. Prerequisite: Geology 111–12. Laboratory fee, $10.

117 *Introduction to Petrology* (3) — Carroll

1963–64 and alternate years: lecture (2 hours), laboratory (3 hours). Lectures on petrogenic theory; laboratory work on the diagnosis of rock genesis by polarizing microscopic determination of mineralogical and textural characteristics. Prerequisite: Geology 115. Laboratory fee, $10.

122 *Structural Geology* (3) — Carroll

Spring: lecture (2 hours), laboratory and field trips as arranged—day. Genetic interpretation of geologic formations on the basis of their structures, with emphasis on applications to geological field work. Prerequisite: Geology 1–2; Physics 11, 12.

123 *Advanced Structural Geology* (3) — The Staff

1963–64 and alternate years: lecture (1 hour), laboratory (4 hours). Introduction to specialized techniques of structural analysis, and to tectonic theory. Prerequisite: Geology 122. Recommended: Mechanical Engineering 10.

128 *Geomorphology* (3) — Teleki

Lecture (2 hours), laboratory and field trips as arranged. 1962–63 and alternate years: spring—day. Nature and evolution of earth forms, interpretation of maps and aerial photographs. Prerequisite: Geology 107 or Geography 115–16.

132 *Economic Geology* (3)

1963–64 and alternate years: lecture (2 hours), laboratory and field trips as arranged. Genesis, distribution, mode of occurrence, and utilization of mineral raw materials. Mining industry in relation to economic life. Prerequisite: Geology 1, 12, 107. Laboratory fee, $10.

151–52 *Invertebrate Paleontology* (3–3) — Teleki

Academic year: lecture (2 hours), laboratory (3 hours), field trips as arranged—day. Taxonomy of fossil invertebrates, development of phyla, paleoecology of invertebrate organisms. Prerequisite: Geology 1–2, 12. Laboratory fee, $8 a semester.

154 *Vertebrate Paleontology* (3) — Hotton

Lecture (2 hours), laboratory or field as arranged. 1962–63 and alternate years: spring—evening. General features of vertebrate morphology and evolution as illustrated by the fossil record; problems of paleoecology and adaptation, where appropriate.

157 *Methods in Paleontology* (3) Sohn
1963–64 and alternate years. An introduction to the principles and techniques of paleontological research, including the rules of zoological nomenclature. Prerequisite: Geology 151–52.

166 *Stratigraphy* (4) Teleki
1963–64 and alternate years. Sedimentation, facies, evaluation of stratigraphic boundaries, principles of correlation, applied stratigraphic geology. Prerequisite: Geology 107, 115, 122.

173 *Regional Geology* (3) Carroll and Staff
1962–63 and alternate years: fall—day. Lecture and map work on the regional distribution of geological formations and structures. This course may be reelected for credit. Prerequisite: Geology 107, 122; Geography 51, or permission of the instructor.

THIRD GROUP

205–6 *Seminar* (3–3) The Staff
Academic year—as arranged. Special topics. Does not repeat itself and may be elected in successive years.

211 *X-ray Crystallography* (3) Christ
1962–63 and alternate years: fall—evening. The structure of crystals as determined by the X-ray method.

212 *Crystal Chemistry** (3) Evans
1962–63 and alternate years: spring—evening. Chemistry of the solid state. Bonding and coordination and the role of crystalline structure in chemistry and mineralogy.

241 *Geochemistry** (3) Fleischer
1963–64 and alternate years. Principles and theories on the abundance, relationships, and the distribution in the various rock and mineral species.

244 *Isotope Geology** (3) Friedman
1963–64 and alternate years. Investigation of geological phenomena by means of stable and unstable isotopes of elements and of changes in their abundance.

251–52 *Micropaleontology* (4–4) Sohn
Lecture (2 hours), laboratory as arranged. Not offered 1962–63. Identification with the binocular microscope of Ostracoda and other fossil micro-organisms. Micropaleontological techniques, paleontological research methods, taxonomy, and paleoecology. Age determination and correlation of stratigraphic units. Laboratory fee, $12 a semester.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged.

GERMANIC LANGUAGES AND LITERATURES†

Professors W. K. Legner *(Chairman)*, Gretchen Rogers
Associate Professor J. C. King
Assistant Professor H. D. Osterle
Associate Anne Cordero

Bachelor of Arts with a major in Germanic Languages and Literatures (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53.
Required in addition to the general requirements, pages 58–62, German 51–52, plus eighteen semester hours in German courses, above the first group; reasonable proficiency in speaking and writing German; History 39–40 or the equivalent; six semester hours in

* Prerequisite: an adequate background in physics and chemistry, to be determined in conference with the instructor.
† The Staff of Instruction here listed is for the academic year 1961–62.

Philosophy selected with the approval of the adviser. Majors in German are strongly advised to study French.

Master of Arts in Germanic Languages and Literatures.—Prerequisite: a Bachelor of Arts degree with a major in Germanic Languages and Literatures from this University, or the equivalent.

Required: the general requirements, pages 64–66, including a reading knowledge of French and a thesis in the field of German literature or linguistics.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Arts in Education with a teaching field in German.—Prerequisite: the Education curriculum, pages 54–55.

Required: the German option and the professional courses listed in the School of Education Catalogue.

First Group

1–2 *First-year German* (3–3) **The Staff**

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. The essentials of German grammar; translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

3–4 *Second-year German* (3–3) **The Staff**

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Selections from modern German prose; continuation and review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: German 1–2 or two years of high school German.

9–10 *German Conversation and Composition* (3–3) **Osterle**

Academic year—day. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

47 *Beginning German for Reading Examination Candidates* (0) **The Staff**

Fall—evening; spring—evening; summer 1962. Specifically for graduate students with little or no German, who are preparing for reading examinations. No academic credit. Tuition fee, $90.

49 *German Readings for Nonmajor Students* (3) **The Staff**

Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or 47, or the equivalent.

51–52 *Introduction to German Literature* (3–3) **Osterle**

Academic year—evening. Prerequisite: German 4 or the equivalent.

Second Group

103–4 *Goethe's "Faust"—Parts I and II* (3–3) **Legner**

1962–63 and alternate years: academic year—evening.

131–32 *German Literature of the Eighteenth Century* (3–3) **Rogers**

1963–64 and alternate years. The age of Lessing, Goethe, and Schiller.

141–42 *German Literature of the Nineteenth Century* (3–3) **King**

1963–64 and alternate years. Romanticism, Biedermeier period, Young Germany, Realism.

151–52 *German Literature of the Twentieth Century* (3–3) **Rogers**

1962–63 and alternate years: academic year—evening.

179–80 *Advanced Composition for Undergraduate and Graduate Majors* (1–1) **King, Legner**

Academic year—as arranged.

THIRD GROUP

201–2 *Middle High German* (3–3) — Legner
1963–64 and alternate years.

205–6 *Gothic* (3–3) — Legner
1962–63 and alternate years: academic year—day. Introduction to the comparative study of Germanic languages.

209–10 *Old High German* (3–3) — King
1962–63 and alternate years: academic year—day.

213–14 *Old Norse* (3–3) — Allee
1963–64 and alternate years.

219 *Teaching German in College* (3) — The Staff
Fall—as arranged. Methodology, observation, and apprenticeship in college classes and the language workshop.

221–22 *General Linguistics; Comparative and Historical Indo-European Linguistics* (3–3) — King
1963–64 and alternate years. *First half:* introduction to linguistics as a science. *Second half:* introduction to comparative and historical linguistics, with special reference to the Indo-European family.

223–24 *Linguistic Analysis of Modern German* (3–3)
1963–64 and every third year. Treatment of phonetics, phonemics, morphology, and syntax.

225–26 *Seminar: Linguistics* (3–3) — King, Allee
1962–63 and every third year: academic year—day. Bibliography, methodology, readings, and research problems.

229 *German Literature of the Fifteenth and Sixteenth Centuries* (3) — Legner
1963–64 and alternate years. Transition from chivalric to bourgeois literature. The eras of Humanism and the Reformation as reflected in the principal literary works.

230 *German Literature of the Seventeenth Century* (3) — Legner
1963–64 and alternate years. Imitation of foreign models. The literary societies. Preciosity. The beginnings of realism in the novel. Pietism.

231–32 *German Classicism* (3–3) — Rogers
1962–63 and alternate years: academic year—day. An advanced study and critique of the literature of the Goethezeit. Prerequisite: German 131–32 or the equivalent.

241–42 *Seminar: German Romanticism* (3–3) — King
1962–63 and alternate years: academic year—evening. Treatment of individual writers, groups, motifs, and tendencies.

251–52 *Seminar: Studies in Twentieth Century German Literature* (3–3) — Rogers
1963–64 and alternate years. Special projects in fiction, drama, poetry, and criticism.

261–62 *German-English and German-American Literary Relations and Interactions* (3–3) — Osterle
Not offered 1962–63. Comparative study of major genres. Appraisal of influences.

271–72 *Seminar: German Literature* (3–3) — Osterle
1962–63 and alternate years: academic year—day. Bibliography, methodology, readings, and research problems.

299–300 *Thesis* (3–3) — The Staff
Academic year—as arranged. Required of all candidates for the Master's degree in German.

HISTORY*

Professors E. L. Kayser, Wood Gray, H. M. Merriman, R. H. Davison *(Chairman)*
Associate Professors W. C. Davis, R. B. Thompson, R. C. Haskett
Assistant Professor C. J. Herber
Instructor P. P. Hill

Bachelor of Arts with a major in History (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including History 39–40 and 71–72.

Required: the general requirements, pages 58–62, and the grade of "pass" on the History major examination at the end of the senior year.

The major, centered on the study of the rise, development, and spread, and the continuing challenges of Western civilization, is attested by a major examination. Under the guidance of an adviser the student will arrange his program in History to attain a balanced coverage of (1) the rise of civilization in Europe to the eve of the French Revolution, (2) the interaction of Western and non-Western culture, especially since the fifteenth century, (3) the historic problems of modern industrial civilization from the beginnings of the Industrial Revolution, and (4) the relations of the major nations of Europe and America in their world setting since the Napoleonic Wars. A six-hour research seminar to give training in fundamental technics is a required part of each major's program, and a proseminar (History 199–200) is offered as a means of integrating the student's understanding of the continuity of Western civilization. For details relating to the administration and content of the major, see the pamphlet on this subject, which is available in the offices of the Dean of Columbian College of Arts and Sciences and the Chairman of the History Department.

Bachelor of Arts with a major in Latin American Civilization (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, see pages 52–53.

Required: the general requirements, pages 58–62, and the grade of "pass" on the Latin American Civilization major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes political and social history, economic development, governmental structures and international relations, and the principal literary works and writers of the Latin American republics. The Department of History provides a proseminar (History 197-98) intended to assist the student in preparing himself for the major examination. For further details, see the pamphlet, which is available in the Office of the Dean of Columbian College of Arts and Sciences.

Master of Arts in the field of History—Prerequisite: the degree of Bachelor of Arts with a major in History from this University, or the equivalent, and the approval of the Department.

Required: the general requirements, pages 64–66. Of the twenty-four semester hours of required second- and third-group courses (exclusive of the thesis), at least six must be in third-group history courses; a maximum of six may be in a closely related field outside the Department of History as approved by the Department. Master's candidates are responsible for arranging with instructors of second-group courses for extra work, in order to receive graduate credit for such courses.

Master of Arts in the field of Latin American Civilization.—Prerequisite: the degree of Bachelor of Arts with a major in Latin American Civilization from this University, or the equivalent.

Required: the general requirements, pages 64–66. Course work and the comprehensive examinations will embrace political and social history, governmental structures and international relations, economic development, and principal literary works of Latin America. The thesis may be written in any one of these four fields. All courses must be approved in advance by the Adviser.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Arts in Education with a teaching field in History.—Prerequisite: the Education curriculum, pages 54–55.

Required: the History option and the professional courses listed in the School of Education Catalogue.

First Group

39–40 *The Development of European Civilization* (3–3) Kayser, Herber
Academic year—day and evening; summer 1962. Primarily for freshmen. *First*

* The Staff of Instruction here listed is for the academic year 1961–62.

half: the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half:* from 1715 to the present.

71–72 *The Development of the Civilization of the United States* (3–3) Haskett, Hill

Academic year—day and evening; summer 1962. Primarily for sophomores. *First half:* the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half:* from 1865 to the present.

SECOND GROUP*

109–10 *Ancient History* (3–3) Kayser

Academic year—day. The political, social, and intellectual aspects will be considered. *First half:* the ancient Near East and Greece. *Second half:* Rome.

111–12 *Medieval History* (3–3) Kayser

Not offered 1962–63. The political, social, and intellectual aspects will be considered. *First half:* from the 4th to the 12th century. *Second half:* from the 13th through the 16th century.

130 *Nationalism* (3) Kayser

Summer 1962. The historical evolution of modern nationalism.

131–32 *History of Germany* (3–3) Herber

Academic year—day. The political, social, and cultural development of the German people. *First half:* from the Reformation to 1871. *Second half:* from 1871 to the present.

141–42 *History of France* (3–3) Herber

Not offered 1962–63. A survey of the political, social, and cultural history of France. *First half:* from earliest times to 1815. *Second half:* from 1815 to the present.

143 *History of Old Russia* (3) Thompson

Not offered 1962–63. The Slavic and Eurasian roots of Russian society and politics over a thousand-year period, 800–1800.

145–46 *History of Modern Russia* (3–3) Thompson

Academic year—day. The rise and fall of the revolutionary cycle. *First half:* Tsarist Russia in the Golden Age, 1800–1917. *Second half:* Soviet Russia and the politics of empire, since 1917.

147 *Economic History of Europe* (3) Gray

Not offered 1962–63. A survey from ancient times to the present day.

148 *Oversea Expansion of Europe* (3)

Not offered 1962–63. International rivalries and the impact of European civilization in Africa and the Pacific basin since 1500, with emphasis on the 19th and 20th centuries.

149–50 *European Diplomatic History* (3–3) Davison

First half: 1963–64 and alternate years. *Second half:* spring—day and evening; summer 1962. Background of the European state system and of diplomatic practices and relations since the Congress of Vienna, with emphasis on the policies and actions of the great powers and their statesmen. *First half:* to 1878. *Second half:* since 1878.

151–52 *English History* (3–3) Kenny†

Academic year—day. A general survey of the development of political, social, and economic institutions of lasting significance in the English speaking world. *First half:* to 1689. *Second half:* since 1689.

161 *Ancient Americans* (3) Davis

1962–63 and alternate years: fall—day. A study of the Maya, Aztec, Inca, and other early civilizations of North and South America.

* History 39–40 is prerequisite to courses 109 through 132 and 190 through 196; History 71–72, to courses 170 through 184; either History 39–40 or 71–72, to courses 161 through 166.

† Appointment effective September 1962.

162 *Iberian Background of Latin America* (3) Davis
Alternate spring and summer terms: spring—day; summer 1962. History of Spain and Portugal, with emphasis on developments leading to the rise and decline of the Spanish and Portuguese empires.

163 *Colonial Latin America* (3) Davis
Fall—evening. Political, economic, social, and institutional developments in Spanish and Portuguese America from the conquest through the wars of independence.

164 *South America since Independence* (3) Davis
Alternate spring and and summer terms: spring—evening; summer 1962. Development of the independent South American states in the 19th and 20th centuries.

166 *Mexico and the Caribbean since Independence* (3) Davis
Alternate spring and summer terms: summer 1963; spring 1964. A survey of the republics of Mexico, Central America, and the Caribbean islands.

170 *American Colonial History* (3) Haskett
Spring—evening. The settlement of the British colonies, the development of provincial institutions, and the emergence of an American civilization in the 17th and 18th centuries.

171–72 *Social History of the United States* (3–3) Gray
Academic year—evening; summer 1962—History 172 (3). Daily life, institutions, intellectual and artistic achievements of the Agrarian Era, 1607–1861; and the Urban-Industrial Era, 1861 to the present time.

173 *Representative Americans* (3) Gray
Spring—day; summer 1962. A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform.

174 *Economic History of the United States* (3) Gray
Fall—day. Main trends in the development of American agriculture, industry, and trade since 1607, with their Old World backgrounds and in their world setting.

175–76 *Political and Constitutional History of the United States* (3–3) Haskett
Academic year—day; summer 1962—History 175 (3). *First half:* to the eve of the Civil War. *Second half:* the Civil War to 1940.

177 *The South* (3) Gray
Not offered 1962–63. Rise of the plantation system and slavery; the intersectional conflict; and the problems and progress of the New South.

178 *The West* (3)
Not offered 1962–63. The role of the frontier in American history.

181–82 *Diplomatic History of the United States* (3–3) Merriman, Hill
Academic year—day and evening; summer 1962—History 181 (3). Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. *First half:* to 1898. *Second half:* since 1898.

183 *Oversea Expansion of the United States* (3) Merriman
Spring—day. The political, economic, social, and cultural life of our outlying possessions.

184 *Canada and the United States* (3) Merriman
Fall—day. The historical background and main trends in the relationship of the two English-speaking peoples of North America.

190 *History of India* (3) Thompson
Not offered 1962–63. The civilization of India and her neighbors from the beginnings to independence.

191–92 *Current History* (1–1)
Academic year—day. Contemporary events in their world setting.

193 *History of the Near East* (3) Davison
1962–63 and alternate years: fall 1962—day. The Byzantine, Arab, Persian, and Islamic backgrounds of Near Eastern history; the rise and decline of the Ottoman Empire; the action of European powers in the area; and the Ottoman breakup into the Turkish Republic and other successor states.

195–96 *History of the Far East* (3–3) Thompson
First half: not offered 1962–63. *Second half:* spring—day. *First half:* the civilization of China and Japan from the beginnings to 1600. *Second half:* the modern Far East under the impact of the West since 1600.

197–98 *Proseminar in Latin American Civilization* (3–3) Davis, Robb, Sammons
Academic year—as arranged. Reading course for coordination and review. Open only to majors in Latin American Civilization.

199–200 *Proseminar: Readings for the History Major* (3–3) Thompson
Academic year—evening. Limited to majors in History. Readings and discussions on main trends in the history of Western civilization, including representative selections from the classics of historical literature.

THIRD GROUP*

211–12 *Reading Course in Medieval History* (3–3)
Academic year—day. Primarily for graduate students.

241–42 *Seminar in Modern European History* (3–3) Herber
Academic year—evening.

243 *Reading Course in Modern European History* (3) Davison
Fall—as arranged. Primarily for graduate students.

246 *Seminar in Eurasian History* (3) Thompson
Spring—evening.

247 *Reading Course in Russian History* (3) Thompson
Fall—evening. Primarily for graduate students.

249 *Seminar in European Diplomatic History* (3) Davison
Fall—day.

251–52 *Seminar in English History* (3–3) Kenny
Academic year—afternoon.

261–62 *Seminar in Latin American History* (3–3) Davis
1963–64 and alternate years.

271–72 *Seminar in the Social History of the United States* (3–3) Gray
Academic year—evening.

273–74 *Reading Course in American Economic and Social History* (3–3) Gray
Academic year—as arranged. Primarily for graduate students.

275–76 *Seminar in American Political and Constitutional History* (3–3) Haskett
Academic year—evening.

277–78 *Reading Course in American Political and Constitutional History* (3–3) Haskett
First half: 1962–63 and alternate years—fall as arranged. *Second half:* 1963–64 and alternate years—fall as arranged. Primarily for graduate students.

* Approval of the instructor is required for registration in each third-group course.

281–82 *Seminar in the Diplomatic History of the United States* (3–3) Merriman
Academic year—day.

285–86 *Reading Course in American Diplomatic History* (3–3) Merriman
Academic year—evening. Primarily for graduate students.

291–92 *Seminar* (3–3) The Staff
Academic year—as arranged; summer 1962—History 291 (3). Prerequisite: approval of the Department.

294 *Seminar in the History of the Modern Near East* (3) Davison
Spring—evening.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962. Required of all candidates for the Master's degree specializing in history.

HOME ECONOMICS*

Professor Kathryn Towne *(Chairman)*
Associate Professorial Lecturer Mary Osterndorf

Bachelor of Science with a major in Home Economics.—Prerequisite: the Home Economics curriculum, page 55. The requirements for the degree are stated on pages 120 and 122.

Bachelor of Arts in Education with a teaching field in Home Economics.—Prerequisite: the Education curriculum on pages 54 and 55.
Required: the Home Economics option and the professional courses listed in the School of Education Catalogue. (See also special bulletin.)

First Group

1 *Food Selection and Preparation* (3)
Not offered 1962–63. Composition, selection, and preparation of food; analysis of recipes; standard products; planning, preparing, serving, and estimating the cost of meals. Material fee, $18.

22 *Clothing: Its Selection, Cost, and Care* (3) Towne
Not offered 1962–63. Clothing selections—the economic, aesthetic, and hygienic aspects; the application of the principles of color and design to individual selection; the care of clothing.

51 *Family Meals* (3) Osterndorf
Fall—day. The choice, purchase, preparation, and service of foods; dietary standards, food habits, and the nutritional needs of the family; problems of purchasing, care, and use of food by the consumer. Material fee, $11.

53 *Family Health and Household Sanitation* (3) Towne
Spring—day. Home hygiene and home care of the sick; the principles of household sanitation in relation to health and diseases.

62 *Clothing Construction* (3) Towne
Not offered 1962–63. Simplified techniques and unit method of construction suitable for cotton, wool, silk, and man-made fibers; the use of commercial patterns and their alteration; the proper selection of color, design, and fabric. Material fee, $8.

* The Staff of Instruction here listed is for the academic year 1961–62.

66 *Fabric Decoration* (3) Towne
Lecture (1 hour), laboratory (4 hours). Not offered 1962–63. Original pattern and color combinations; application to a variety of hand methods of decorating fabrics for use as clothing, draperies, and upholstering; use of stencils, block and screen printing, and other simple equipment.

71 *Costume Design and Fashion Economics* (3) Towne
Not offered 1962–63. Factors determining fashions and effect on cost of clothing, problems of the consumer of textiles and clothing, historic costume and its relation to modern dress. Material fee, $8.

72 *Household Textiles* (3) Towne
Not offered 1962–63. Properties, uses, and tests of the different textile fibers and fabrics, and development of judgment and knowledge of standard for the consumer of clothing and house-furnishing material. Material fee, $8.

77 *Marketing* (3)
Not offered 1962–63. Purchasing of foods as it relates to the home and to the institution.

SECOND GROUP

102 *Advanced Food Preparation* (3) Osterndorf
Spring—day. The application of the fundamental processes of food preparation to a wider range of food materials and various services for different occasions. Material fee, $18.

106 *Quantity Cookery* (3)
Not offered 1962–63.

123 *Household Finance and Problems of the Consumer* (3) Towne
Not offered 1962–63. Economic problems of the family in modern industrial society, family income, income apportionment and household expenditures, laws affecting the home, investments, consumer buying.

143 *Advanced Clothing Construction* (3) Towne
Not offered 1962–63. Problems of clothing construction and flat pattern designing. Material fee, $8.

148 *Food Problems and Demonstration Methods* (3)
Not offered 1962–63. Factors affecting the preparation of standard products from the experimental viewpoint, principles of demonstration. Material fee, $18.

152 *Nutrition* (3)
Not offered 1962–63. Lecture course on the principles of normal and abnormal human nutrition. Laboratory work on the calculation and preparation of dietaries. Laboratory fee, $8.

154 *Diet Therapy* (3)
Not offered 1962–63. Study of nutrition as applied to diet and disease. Material fee, $8.

164 *Child Nutrition* (3) Osterndorf
Fall—day. Basic principles and practices in nutrition at infant, pre-school, and adolescent ages. Demonstration of nutritional and special food requirements.

168 *Institutional Management* (3)
Not offered 1962–63. Study of the organization, equipment, and marketing problems of institutions.

171 *House Furnishing* (3) Towne
Fall—day. Home planning from the historic, artistic, economic, and sanitary viewpoints; home furnishings such as linens, dishes, floor covering, mattresses, etc. Material fee, $5.

172 *Problems in Home Furnishings* (3) Towne
Lecture (1 hour), laboratory (4 hours). Not offered 1962–63. Workshop-type course in home furnishings, including upholstering, slip covering, refinishing furniture, and making draperies.

181 *The Child in the Home* (3)
Not offered 1962–63. Care and development of children, parent-child relationships.

192 *The Home, Its Management and Equipment* (3) Towne
Fall—day. Economic management of the home; distribution of time and energy; problems in the selection, arrangement, and care of equipment.

193 *Supervision of Home Management* (3) The Staff
As arranged. Field work under supervision. Designed to meet requirements of those preparing to teach in federally aided schools.

195 *Special Problems* (3) The Staff
Spring—day. Individual investigation or study under the guidance of a member of the Staff. Topic for 1962–63: tailoring.

197–98 *Proseminar* (3–3) The Staff
Academic year—evening. The study of the most recent materials and problems in the various phases of home economics.

JOURNALISM*

Professor R. P. Schlabach, Jr. *(Chairman)*
Associate Professor R. C. Willson
Lecturers F. L. Dennis, J. V. Hinkel, Louis Robinson, T. R. Smith

Bachelor of Arts with a major in Journalism (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including English 51–52 or 71–72, History 71–72, Political Science 9–10, and Journalism 71–72.
Required:
(1) The general requirements, pages 58–62.
(2) Twenty-four hours of second-group courses in Journalism, as follows: (a) Journalism 111, 196, 198; (b) nine hours chosen from Journalism 121, 133, 137, 144, 151; (c) six hours chosen from Journalism 115, 140, 142, 143, 145.
(3) Twelve hours of second-group courses, chosen in consultation with the major adviser, in one other department of Columbian College of Arts and Sciences. Students selecting science may take courses in more than one department.

First Group

71–72 *Journalism in American Society* (3–3) Willson
Academic year—day and evening. Evolution of newspapers and other media in relation to political, social, and economic life; the concept of press freedom; problems of contemporary journalism.

Second Group

111 *Reporting* (3) Schlabach
Fall—day; spring—evening; summer 1962. Instruction and classroom practice in gathering, evaluating, and writing news; emphasis on newspapers, other media considered.

115 *Editing and Make-up* (3) Schlabach
Fall—evening; summer 1962. Editing of news and other material for publication, typography and display; use of pictures and other graphic presentations.

* The Staff of Instruction here listed is for the academic year 1961–62.

121 *Advanced Reporting: Magazine Feature Articles* (3) Willson
Spring—day; summer 1962. Instruction and practice in writing magazine articles, material for which is obtained through independent investigation.

133 *Advanced Reporting: Community News* (3) Schlabach
Fall—day. Instruction and practice in coverage and writing of local news.

137 *Advanced Reporting: National Affairs* (3)
Not offered 1962–63. Instruction and practice in coverage and writing of federal government news from the point of view of the press association.

140 *Pictorial Journalism* (3) Smith
Spring—evening. Photographic techniques affecting publication, the illustration and the story angle, standards of judgment in selection and use of pictures, captions, editing technique, cropping for effective reproduction.

142 *Retail Newspaper Advertising* (3) Robinson
Spring—evening. Retail newspaper advertising management, coordination of newspaper advertising with retail sales patterns, advertising readership, copy preparation, production methods.

143 *Industrial Communications* (3) Willson
Fall—evening. An introduction to the field of corporate journalism. Writing and editing the employee magazine. Preparation of annual reports. Editing stockholder publications, and external house organs.

144 *Advanced Reporting: the Arts and Sciences* (3) Willson
Not offered 1962–63. Instruction and practice in writing articles for publication in such fields as the arts, business and economics, science, and technology.

145 *Principles and Problems of Public Relations* (3) Hinkel
Fall—Saturday morning. Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs.

151 *Editorial Writing* (3) Schlabach
Spring—day. Instruction and practice in writing of editorials on public affairs.

196 *Seminar* (3) Schlabach
Spring—as arranged. For Journalism majors only. Research in areas relating journalism to secondary fields of study.

198 *Law of the Press* (3) Dennis
Fall—Saturday morning. Freedom of the press, censorship, legislative controls, publications as contempt of court, copyright, news gathering agencies, labor law and the newspaper business, law of libel, privileged matter, fair comment on public characters, right of privacy.

LAW*

Professors W. T. Fryer, C. D. Benson, J. F. Davison, O. S. Colclough, L. S. Merrifield, O. H. Walburn, D. B. Weaver†, L. H. Mayo, G. E. Weston, R. M. Cooper, W. T. Mallison, Jr., C. B. Nutting, R. G. Dixon, Jr., Robert Kramer, A. S. Miller
Adjunct Professor J. W. Jackson
Professorial Lecturers J. A. McIntire, J. L. Edgerton, P. F. Herrick, G. E. Monk, C. J. Zinn, L. J. Harris, L. P. Walsh, E. A. Beard, Murdock Head, G. N. Robillard, G. L. Hart, Jr., Lester Nurick, W. S. Surrey

* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence 1961–62.

Associate Professors J. R. Hambrick, G. A. Ledakis, M. H. Freedman, R. C. Nash, Jr., D. C. Green, W. W. Kirkpatrick
Associate Professorial Lecturers P. A. Rose, H. J. Liebesny, T. H. Brown, G. J. Goldsborough
Assistant Professors W. J. Baker, J. J. McAvoy, R. J. Temple, D. E. Seidelson, D. J. Sharpe, J. P. Sullivan
Lecturers W. W. Goodrich, M. F. Cohen, H. P. Green, F. A. Potts, G. D. Cary, S. S. Cohen, I. H. Rimel, A. H. Kaplan
Clerk of the Trial Practice Court J. A. Kendrick
Associate Clerk of the Trial Practice Court D. G. Skinker

For the requirements for the degrees of *Bachelor of Laws, Master of Laws, Master of Comparative Law, Master of Comparative Law (American Practice)*, and *Doctor of Juridical Science*, see pages 90–92, 94–95.

First Year

110 *Constitutional Law* (4) — **Mayo, Dixon, Miller**

Spring—day and evening. Basic principles of American constitutionalism; judicial function in constitutional cases; implementation of doctrines of separation of powers, federalism, limited government; development and exercise of national powers; introduction to civil rights and liberties.

115–16 *Contracts I-II* (4–2) — **Mayo, Miller, Freedman, Temple**

Academic year—day and evening; summer 1962. Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, and remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, and problems of proof; the function of consideration; conditions; assignments; third-party beneficiaries; the effect of changed circumstances; and protection of the client's interests upon breach or threat of breach by the other party. Emphasis on problems of analysis, draftsmanship, and adversary method.

125 *Criminal Law and Procedure* (4) — **Cooper, Sharpe, Green**

Spring—day and evening. Origin and purposes of criminal law; elements of criminal liability; mental disorders; solicitation, attempt, and conspiracy; crimes against the person, against property, and against both; statutory offenses; criminal procedure, with consideration of Federal Rules of Criminal Procedure.

135 *Legal Method and Legal System* (4) — **Fryer, Benson, Sharpe, Goldsborough**

Fall—day and evening; spring—day and evening. Introduction to substantive and procedural law dealing with basic concepts; training in method and technique of case law and legislation using modern case records; practice in use of law books and in legal writing; importance of language in law; legal reasoning and use of precedents under doctrines of stare decisis, law of the case, and res judicata; development of Anglo-American legal system; organization of judiciary and bar, stressing enforcement of ethical standards.

145 *Personal Property* (2) — **Fryer, McAvoy, Sullivan, Green**

Fall—day and evening; spring—day and evening. Concepts of property, including interests created by bailments, liens, and pledges; methods of acquiring ownership.

150 *Real Property* (4) — **Benson, Walburn, Sullivan, Baker**

Fall—day and evening; spring—day; summer 1962. Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and tenant relationship; concurrent estates; future interests at common law and after the Statute of Uses; the Rule Against Perpetuities; incidents of divided ownership, as waste; natural rights.

160 *Torts* (4) — **Merrifield, Walburn, Temple, Seidelson**

Fall—day; spring—day and evening. Liability for harm to others: intentional misconduct; the law of negligence, including consideration of fault and appropriate dis-

tribution to risk-costs as bases of liability; comparison of liability for physical harm with liability for mental and economic harm.

Second Year

201 *Agency* (2) — Cooper, Freedman

Fall—day and evening; summer 1962. Master and servant (status of agent), respondeat superior, nature of agency relation, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification.

202 *Administrative Law* (3) — Davison

Fall—evening; spring—day; summer 1962 (as a four-credit course). The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies.

205 *Appellate Practice and Procedure* (2) — Freedman

Spring—day and evening. Appellate practice and procedure will be studied through texts; consultation with appellate judges and law clerks and with attorneys who have cases pending on appeal; observation of arguments in the United States Supreme Court and the Court of Appeals for the District of Columbia Circuit; and analysis of records, briefs, and oral arguments in actual and in moot cases. Each student will brief and argue one advanced-level moot case and will prepare one moot court record for use in first-year Case Club. Students taking this course will take only two hours of Trial Practice Court. Admission by permission of the instructor.

210 *Business Associations* (4) — McAvoy, Seidelson, Kirkpatrick

Fall—day and evening; summer 1962. Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share structure; problems of operation; relations between partners; roles of shareholders, directors, officers; control devices; distributions to owners; voluntary reorganization; dissolution and termination.

215 *Civil Procedure* (4) — Walburn, Temple, Green

Fall—day and evening; summer 1962. The mechanics of litigation—the rules which govern the process by which the rights and duties studied in substantive law courses are enforced: pleadings, discovery, pre- and post-trial motions, jurisdiction and venue, equity jurisdiction and trial by jury, former adjudication. Emphasis is on the Federal Rules of Civil Procedure but the principles and main problems indigenous to all procedural systems are developed.

219 *Commercial and Investment Paper* (3) — Ledakis

Fall—day and evening; summer 1962 (as a four-credit course). Bills of exchange, promissory notes, checks, bonds, certificates of stock, and other forms of commercial and investment paper in the context of their business function and legal setting under the common law and uniform laws, including the proposed Uniform Commercial Code.

224 *Sales and Sales Financing* (3) — Ledakis

Spring—day and evening. The law relating to the sale and distribution of goods and to the security financing devices utilized in this connection, with particular attention to the effect of existing and proposed uniform laws.

230 *Conveyances* (2) — Baker

Fall—day and evening; spring—evening; summer 1962. Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and adverse user; zoning and other land controls.

235 *Domestic Relations* (2) — Potts, Seidelson

Fall—day and evening; spring—evening; summer 1962. Marriage, annulment, and divorce; adoption and custody of children; economic relations.

238 *Equity* (2) — Sullivan

Spring—day and evening; summer 1962. A correlation of aspects of equity considered in earlier courses, and inquiring into the nature of equity jurisprudence through

analysis of selected problems in equity: historical development of equity, including problems of merger of law and equity; use of equity jurisdiction offensively and defensively, including multi-party actions, injunction of executive and legal actions, and equitable abstention; emphasis on the fashioning of equitable remedies.

240 *Evidence* (4) — Fryer

Spring—day and evening; summer 1962. Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule.

243 *Federal Jurisdiction* (2) — Cooper, Kirkpatrick

Fall—day and evening. Constitutional and statutory origins of federal courts, cases arising under the laws and the Constitution, diversity of citizenship, jurisdictional amount, removal procedure and jurisdiction, limitations on federal jurisdiction, state and federal conflicts, substantive law applied by federal courts.

251 *Insurance* (2) — Temple

Fall—day; summer 1962. A primary risk distributing medium and the rules by which legislative, administrative, and judicial bodies seek to promote its benefits and avert its dangers. Includes insurance marketing, insurable interest, subrogation, transfer of insurance benefits to nonpolicyholders, coverage and other insurance policy provisions, disposition of claims.

254 *International Law and World Order* (3) — Mallison

Fall—day and evening. Traditional content of course in international law presented in context of values and institutions of the world community; formal prescription and effective practice concerning participants in decision-making processes; roles of individuals, international public organizations, political parties, pressure groups, private associations, and national states.

259 *Labor Law* (3) — Merrifield

Spring—day and evening. Law governing labor-management relations, organization and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intraunion relations.

265 *Law and Accounting* (2) — S. Cohen

Spring—evening. Study of fundamental accounting principles with emphasis on corporation accounting; legal and accounting implications of specific items on financial statements of corporations; inventory adjustments; corporate transactions, distributions, and capital adjustments.

270 *Legislation* (2) — Nutting, Mallison

Fall—evening; spring—day; summer 1962. The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation.

274 *Taxation—Federal Estate and Gift* (2) — Kramer, Hambrick

Fall—day and evening. A survey of the substantive provisions of the federal estate and gift tax laws, including inter vivos transfers, transfers in contemplation of death, joint interests, life insurance proceeds, property subject to powers of appointment, the marital deduction and split gifts; tax procedure.

279 *Taxation—Federal Income I* (3) — Hambrick, Weaver

Fall—day and evening; summer 1962 (as a four-credit course). Survey of substantive provisions of federal income tax, including concept of gross income, provisions affecting taxation of the family and individual transactions, limitations on allowable deductions, sales and dispositions of property, problems of capital gains taxation, and nontaxable exchanges.

280 *Taxation—Federal Income II* (2) — Hambrick, Weaver

Spring—day and evening. Survey of substantive provisions of federal income tax with respect to tax accounting, estates and trusts, and partnerships. Prerequisite: Law 279.

285–86 *Trusts and Estates I-II* (3–3) **Weaver, McAvoy**

Academic year—day and evening. An integrated view of considerations (other than tax) in noncommercial transfers of wealth at death or during life with emphasis on the drafting of documents best suited to achieve the wishes of the property owner and meet the needs of his family. *First half:* distribution and administration of intestate estates; formal requirements for execution of wills and trusts; revocation and alteration; grounds for contest; limits on testamentary freedom. *Second half:* dispositive provisions in wills and trusts; common problems of construction; future interests questions including class gifts, powers of appointment, and limits imposed by Rule Against Perpetuities, etc.; problems of administration of estates and trusts including allocations to principal or income, investments, powers to manage, sell, etc.; charitable trusts. Supervised practice in drafting is included. Prerequisite to Law 286; Law 285.

295 *Unfair Trade Practices* (3) **Weston**

Fall—day and evening; summer 1962 (as a four-credit course). Unfair trade practices at common law and under statutes; trade-marks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Federal Trade Commission Act; resale price maintenance under state Fair Trade Acts; state sales-below-cost statutes; Robinson-Patman Price Discrimination Act; miscellaneous business practices.

THIRD YEAR

302 *Admiralty* (2) **Sharpe**

Fall—evening. Sources and characteristics of the maritime law of the United States, jurisdiction of federal and state courts, personal injury and death questions peculiar to seamen and maritime workers, collision, limitation of liability.

307 *Comparative Law* (3) **Davison**

Spring—evening. The Civil Law System; general introduction to foreign law as exemplified by Roman Law and the French and German Civil Codes; comparative study of administration of justice and legal institutions. This course deals with delictual and contractual obligations.

309 *Conflict of Laws* (3) **Dixon, Seidelson**

Fall—day and evening; summer 1962 (as a four-credit course). Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations.

311 *Copyright Law* (2) **Weston, Cary**

Spring—evening. Historical background; formalities and essentials in securing a copyright; subject matter of copyright; remedies; international aspects of copyright under Berne Union, Universal Copyright Convention, and Inter-American Convention; copyright licensing and performing right societies.

313 *Constitutional Interpretations* (2) **Dixon**

Not offered 1962-63. Advanced course in constitutional law. The Constitution and constitutional tradition, process of judicial decision-making, significance of "due process", current constitutional developments, adequacy of the traditional system of powers and limitations, introduction to comparative constitutional law.

318 *Creditors' Rights* (3) **Kirkpatrick**

Spring—day and evening; summer 1962 (as a four-credit course). Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration.

321–22 *Current Decisions* (2–2) **Seidelson, Sullivan**

Academic year—day and evening. Required of, and limited to, members of the student staff of the *Law Review*.

330 *Federal Antitrust Laws* (3) Weston, Kirkpatrick
Spring—day and evening. Restraints of trade at common law and under Sherman Antitrust Act of 1890, Federal Trade Commission and Clayton Acts by mergers, monopolies, price-fixing agreements, trade associations, exclusive-dealing agreements, tie-in sales, and trade boycotts; patents and copyrights under antitrust laws.

335 *Jurisprudence* (2) Mayo, Kramer
Fall—evening; spring—day. History of jurisprudence; schools of jurists, particularly the nineteenth century schools; sociological jurisprudence; theories of justice; the nature of law; law and morals; law and the state; the scope and subject matter of law; sources and forms of law; the traditional element; analysis of general legal concepts.

339 *Collective Bargaining and Labor Arbitration* (2) Merrifield
Fall—evening. The collective labor agreement: its content, negotiation, and administration through the grievance procedure and arbitration; problems in the settlement of labor disputes.

341 *Labor Standards and Social Security Legislation* (2) Merrifield
Not offered 1962–63. Legal problems arising under federal and state statutes dealing with labor standards and social security. Particular emphasis is placed upon the regulation of wages and hours, workmen's compensation, and insurance against unemployment and old age.

345 *Legislative Drafting* (2) Zinn
Fall—evening. Advanced instruction and practice in legislative drafting.

349 *Local Government Law* (2) Mallison
Spring—evening; summer 1962. The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development.

355 *Mortgages* (2) Ledakis
Summer 1962. Security interests in real property, their creation, transfer, enforcement and extinguishment.

359 *Patent Law** (2) Robillard
Fall—evening. Origin and nature of patents, patentable subject matter, classes of patents, novelty, utility, invention, patent claims and their interpretation, acts constituting infringement, correction of patents.

360 *Advanced Topics in Patent Law* (2) Harris
Spring—evening. Lectures and discussion; licensing and protection of industrial property; uses and abuses of patents; governmental regulation; protection abroad; the role of patents in business; economic and social functions of patents, trade-marks, and copyrights. Prerequisite: Law 359.

362 *Patent Office Practice** (2) Rose
Spring—evening. Rules and practice; appeal and interference procedure.

365–66 *Patent Trial Practice Court** (2–2) Brown, Rimel
Academic year—evening. Practice before the United States Court of Customs and Patent Appeals and the federal courts. Prerequisite: forty-two semester hours, including Law 215 and 240. Law 359, which is also required, may be taken concurrently. *Patent Trial Practice Court* may be elected instead of Law 385–86 to satisfy the Trial Practice Court requirement. If *Patent Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.

370 *Public Utilities* (2) Fryer, Davison
Spring—evening. Regulation by federal, state, and municipal authorities concerned with licensing, rates, services, and practices, with emphasis on federal regulation of interstate operations; judicial review.

* Patent law students may take Law 359 and Law 365 concurrently in the fall semester and Law 362 and Law 366 concurrently in the spring semester.

376 *Restitution* (2) — Sharpe

Spring—day and evening; summer 1962. Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment.

378 *Security Transactions* (3)

Spring—day and evening. Suretyship and mortgages: security interests in real and personal property, their creation, transfer, enforcement, and extinguishment; the law of suretyship, especially in the context of accommodation credit and commercial and financial practices.

380 *Suretyship* (2) — Ledakis

Summer 1962. The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and non-consensual suretyship relations and the place of suretyship principles in the solution of legal problems generally.

385–86 *Trial Practice Court* (2–2) — Jackson, Edgerton, Herrick, Monk, Walsh, Beard, Hart, Kendrick, Skinker

Academic year—day and evening. Trial of assigned cases; trial tactics and techniques; pre-trial and court room procedures pursuant to Federal Rules.

To be taken in the senior year. Prerequisite: forty-two semester hours, including Law 215 and 240. If *Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.

391 *United Nations Constitutional Law* (2) — Mallison

Spring—evening. Structure and process of decision of the United Nations—the peaceful settlement of disputes, collective security, regulation of armaments, regional arrangements, and types of functional cooperation.

Graduate Courses

401 *Administrative Law Seminar* (2) — Davison

Spring—evening. Group study of specific problems in administrative law.

408 *Constitutional Law Seminar* (2) — Nutting, Dixon

Spring—day. Group study of contemporary problems in constitutional law.

412 *Control and Use of Atomic Energy* (2) — Green

Spring—evening. Various legal problems involved in the control and use of atomic energy will be examined, including the Atomic Energy Act, the policy underlying the present government monopoly, the security problem of safeguarding atomic military information, the implications in prospective industrial control and use, and legal means of protecting personal interests against the possible consequences of atomic warfare.

415 *Administration of Criminal Justice* (2) — Nutting

Spring—evening. Selected problems in the field such as arrest, police interrogation, electronic interception, discovery, and the relative positions of prosecution and defense in preparing cases. The professional responsibility of lawyers will be emphasized.

420 *Estate Planning Seminar* (2) — Weaver

Spring—evening. Group study of the effective disposition of wealth, inter vivos and testamentary gifts, conservation for owner's future use, use of insurance, tax and administrative problems, business interests, pension and profit-sharing arrangements.

424 *Evidence and Trials Seminar* (2) — Fryer

Fall—evening. Study of selected problems involving presentation of documentary proof and expert testimony in connection with the reforms sought by the Uniform Rules of Evidence and recent developments in the field of forensic medicine.

426 *Forensic Medicine* (2) — Head, Sharpe

Fall—evening. Introduction to problems created by the relationships between medicine and the law: a survey of the medical professions; medical education, specialties,

ethics, and professional organizations; an outline of hospital organization and facilities; selected studies in the analysis and presentation of medical aspects of legal controversies, as in personal injury litigation, workmen's compensation claims, and disputes over mental capacity, both civil and criminal; the lawyer's role in domestic and international governmental activities in medicine and public health.

428 *Food and Drug Law* (2) Goodrich, Kaplan
Spring—evening. A lecture and discussion course dealing with the Federal Food, Drug, and Cosmetic Act and governmental controls thereunder. Both government and industry viewpoints are considered.

431 *Government Contracts I* (2) McIntire
Fall—evening. A consideration of the basic power of the Federal Government to enter into contracts; the nature and construction of such contracts; normal and war or defense powers aspects of government procurement, including administrative and legislative policy and procedures; forms of contracts; standard clauses; advertised bid procedure problems; negotiated contracts; modification of contracts; remedies on contractual claims.

432 *Government Contracts II* (2) McIntire
Spring—evening. Special problems in government contracts, including adjustments and relief; procedure for prosecuting claims under government contracts; attempts at price, cost, or profit control; termination. Prerequisite: Law 431.

436 *International Regional Organizations Seminar* (2) Miller
Fall—evening. Legal and policy questions involved in American participation in multinational organizations, including General Agreement on Tariff and Trade, Organization for Economic Cooperation and Development, North Atlantic Treaty Organization, and Organization of American States. Concepts of sovereignty and nationalism will be studied. Special attention will be accorded the nascent "Atlantic Community."

440 *Legal Aspects of International Business Transactions* (2) Nurick, Surrey
Spring—evening. United States law and practice, including current antitrust and tax problems; brief comparison with the British and Civil Law systems; international law, foreign contracts, choice of law; currency considerations; effect of S.E.C. laws and regulations; international trade, including GATT and reciprocal trade arrangements; sources of finance, both United States and foreign, private and public, including international organizations; and selected case studies. In addition to the regular lecturers, there will be guest lecturers in their specialties.

442 *Labor Law Seminar* (2) Merrifield
Fall—evening. Group study of contemporary problems in labor law.

449 *Law of the Near East* (2) Liebesny
Not offered 1962–63. A study of the law of the Arab countries, including the basic principles of the Islamic law, an analysis of the present day codes, and an investigation of the Western influences on the laws of the Arab countries.

455 *Legal Problems in Modern Methods of Warfare* (2) Mallison
Fall—evening. The contemporary international law of war; legal aspects of modern methods of coercion (economic, political, psychological, and military); regulation of hostilities; the special problems of atomic, bacteriological, and chemical weapons; war crimes.

463 *Regulation of Communication Media* (2) Mayo
Fall—evening. An examination of the legal doctrine relating to regulatory practices in the channels of mass communication, i.e., newspapers, motion pictures, and radio-television; analysis of the operational structure of the mass media and the pattern of control exercised by government, private associations, and various community groups; appraisal of the comparative utility of various regulatory techniques for implementing policies affecting these media; special emphasis will be placed on the functions of the Federal Communications Commission.

466 *Regulation of Securities and Securities Markets* (2) M. Cohen
Fall—evening. A study of state and federal laws governing the offering and distribution of securities to the public by corporate issuers and others, the regulation of securities markets, and the rights and liabilities of purchasers under such statutes. Particular emphasis will be given to statutes administered by the Securities and Exchange Commission.

469 *Research in Patent, Trade-Mark, and Copyright Law* (2) Harris
Fall—as arranged; spring—as arranged. Registration limited to students with at least a *B* average who have taken Patent Law I and II and related courses including, as a rule, Trade Regulation Seminar. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

471 *Research in Public Law* (2) The Staff
Fall—as arranged; spring—as arranged. Registration limited to students with at least a *B* average who have had a seminar or comparable course in field of proposed research. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

475 *Taxation—Corporate* (2) Hambrick
Fall—evening. Analytical study of income tax problems in corporate dividends and distributions in redemption of stock; corporate liquidations; reorganizations, mergers and acquisitions; recapitalizations; organization and sales of corporate businesses; collapsible corporations; carryovers. Prerequisite: Law 279.

480 *Taxation—Oil and Gas* (2) Hambrick
Spring—evening. A study of the application of the Federal income tax to the producing segment of the oil and gas industry; common types of interests in producing properties; tax treatment of exploration expenditures; intensive study of problems in the deduction of intangible development and drilling costs; the concept of "economic interest"—who is entitled to depletion?; tax distinctions between leasing transactions, sharing transactions, and sales of oil and gas properties and prospects; "ABC" transactions; organizational problems in oil and gas ventures—joint operating agreements, general and liquid partnerships, associations taxable as corporations and pooling arrangements; "carried interests" and other financial arrangements in development of oil and gas properties. Prerequisite: Law 279.

485 *Taxation Seminar* (2) Hambrick
Spring—evening. Selected problems in federal income, estate and gift taxation, involving factual analysis and legal research, and the preparation of memoranda of law, legislative drafting or other appropriate disposition. Identical problems or cases will be assigned to small groups for development and disposition. Registration subject to approval of teacher. Prerequisite: Law 274 and 279.

490 *Income Taxation of Foreign Business and Investment* (2) Hambrick
Fall—evening. The provisions and policies of the Federal Income Tax law applicable to foreign income, including considerations affecting the choice of methods of engaging in foreign business and investment, allocation of income in foreign commerce, credit for foreign taxes, principles and trends of U. S. tax treaties, including "tax sparing." The emphasis of the course is on analytical treatment of existing law and present and proposed tax policy with respect to foreign business and investment.

492 *Trade Regulation Seminar* (2) Weston
Spring—evening. Group study of current problems relating to unfair trade practices and federal antitrust laws.

495 *Urban Redevelopment* (2) Baker
Spring—evening. Selected problems in urban redevelopment and housing, with particular emphasis on programs under current federal and state legislation.

MATHEMATICS*

Professors F. E. Johnston, Florence Mears, N. D. Nelson *(Chairman)*, T. P. G. Liverman, N. A. Wiegmann
Professorial Lecturers W. H. Marlow, D. M. Dribin, Thomas Saaty
Associate Professorial Lecturers Joseph Blum, P. A. Devore, J. P. Fennell
Assistant Professors W. A. Smith, R. Z. Vause, Hewitt Kenyon
Lecturers Mabel Morris, A. J. Ziffer, Howard Banilower, Jerome Deutschberger, R. F. Snyder, R. A. Welker

Bachelor of Arts or *Bachelor of Science with a major in Mathematics (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53. Required: in addition to the general requirements, pages 58–62, twenty-four semester hours of Mathematics of approved second- and third group courses.

Master of Arts or *Master of Science in the field of Mathematics.*—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Mathematics at this University, or the equivalent.
Required: the general requirements, pages 64–66.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Science in Engineering with an option in Mathematics.—See pages 100–101, 103–4.

Bachelor of Arts in Education with a teaching field in Mathematics.—Prerequisite: the Education curriculum, pages 54–55.
Required: the Mathematics option and the professional courses listed in the School of Education Catalogue.

First Group†

3 *College Algebra* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 *Plane Trigonometry* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

9 *General Mathematics I* (3) — The Staff
Fall—day; spring—evening; summer 1962 (offered as Mathematics 2). For those students in the School of Education or others electing Mathematics 9 and 10 as a terminal sequence in mathematics. Propositional logic and truth values; the number system, number bases, arithmetical computation; algebraic functions; topics from plane geometry. Prerequisite: two years of high school mathematics. Not open to students who have had former Mathematics 2.

10 *General Mathematics II* (3) — The Staff
Spring—day. An introduction to matrices and vector spaces; non-Euclidean geometry; introduction to concepts of the calculus. Prerequisite: Mathematics 9 or former 2.

12 *Analytic Geometry* (3) — The Staff
(This course will be offered for the last time summer 1962.)
Summer 1962. Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

21 *Calculus I* (3) — The Staff
Fall—day and evening; spring—day and evening. Elementary concepts of analytic geometry. Differentiation and integration of algebraic and trigonometric functions

* The Staff of Instruction here listed is for the academic year 1961–62.
† No first-group course in mathematics is available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.

with applications. Prerequisite: Mathematics 3 and 6; or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or the equivalent.

22 *Calculus II* (3) — The Staff
Spring—day and evening. Differentiation and integration of transcendental functions and applications; conics; parametric equations; techniques of integration. Prerequisite: Mathematics 21.

23 *Calculus III* (3) — The Staff
Spring—evening. Vector concepts; improper integrals; solid geometry; partial differentiation and applications. Prerequisite: Mathematics 22.

24 *Calculus IV* (3) — The Staff
Offered 1963–64. Multiple integration with application; infinite series; differential equations. Prerequisite: Mathematics 23.

27 *Calculus I and II* (6) — The Staff
The equivalent of Mathematics 21 and 22.
Fall—day and evening; spring—day.

28 *Calculus III and IV* (6) — The Staff
The equivalent of Mathematics 23 and 24.
Spring—day.

29 *Calculus I* (3) — The Staff
(This course is being offered for the last time summer 1962.)
Summer 1962. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

30 *Calculus II* (3) — The Staff
(This course is being offered for the last time fall semester 1962–63.)
Fall—day and evening; summer 1962. Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.

31 *Calculus III* (3) — The Staff
(This course is being offered for the last time spring semester 1962–63.)
Fall—day and evening; spring—day and evening; summer 1962. Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor).

Second Group*

101 *Introduction to Mathematical Logic* (3) — Nelson
Fall—evening. Development of propositional and predicate calculi, basic semantic concepts, elementary intuitive set theory, Boolean algebra. Prerequisite: Mathematics 31 or 24 or Philosophy 121.

102 *Fundamental Concepts of Mathematics* (3) — Nelson
Spring—evening. Axiomatic set theory, cardinal and ordinal arithmetic, foundations of the real number system. Prerequisite: Mathematics 101 or permission of the instructor.

106 *Topology for Undergraduates* (3) — Kenyon
1963–64 and alternate years.

111 *Mathematics for Engineers and Physicists I* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 31 or 24.

* Mathematics 31 or 24 is prerequisite to all second-group courses.

112 *Mathematics for Engineers and Physicists II* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.

120 *Introduction to Theory of Numbers* (3) — Vause
1963–64 and alternate years.

122 *Introduction to Abstract Algebra* (3) — The Staff
Fall—evening.

123 *Theory of Equations* (3)
Not offered 1962–63.

124 *Introduction to Matrix Theory* (3) — The Staff
Fall—day; spring—evening; summer 1962. Elementary theory of finite vector spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices.

125 *Advanced Algebra* (3)
Not offered 1962–63.

126 *Advanced Analytic Geometry* (3)
Not offered 1962–63.

132 *Differential Equations* (3)
Not offered 1962–63.

134 *Introduction to Boundary Value Problems* (3) — The Staff
Spring—evening. Prerequisite: Mathematics 111, 132, or 142.

135 *Projective Geometry* (3) — The Staff
Fall—evening.

139 *Advanced Calculus I* (3) — The Staff
Fall—evening; spring—day; summer 1962. Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.

140 *Advanced Calculus II* (3) — Mears
Spring—evening. Vector fields, multiple integrals, line and surface integrals, point set theory, theory of integration, improper integrals. Prerequisite: Mathematics 139.

141 *Introduction to Infinite Series* (3) — Mears
Fall—evening.

142 *Theory of Differential Equations* (3)
Fall—evening. Prerequisite: Mathematics 139.

167 *Fourier Series and Spherical Harmonics* (3)
Not offered 1962–63. Prerequisite: Mathematics 111 or 132.

171 *Vector Analysis* (3) — The Staff
Fall—day; spring—evening.

THIRD GROUP

201–2 *Mathematical Logic* (3–3) — Nelson
1963–64 and alternate years.

220 *Theory of Numbers* (3) — Vause
1963–64 and alternate years.

237–38 *Theory of Functions of a Complex Variable* (3–3) — Johnston
A year course: credit is not given for the first half until the second half is completed.
1963–64 and alternate years.

242 *Infinite Series* (3) Mears
Spring—evening.

243–44 *Numerical Analysis* (3–3) Marlow
1963–64 and alternate years. Prerequisite: Mathematics 111, 132, or 142.

249 *Ordinary Differential Equations* (3)
Fall—evening.

250 *Integral Equations* (3)
Not offered 1962–63.

251–52 *Theory of Functions of a Real Variable* (3–3) Liverman
A year course: credit is not given for the first half until the second half is completed.
Academic year—evening.

255 *Differential Geometry* (3)
Not offered 1962–63.

257 *Theory of Groups* (3) Johnston
Fall—evening.

261 *Generalized Functions and Operational Methods* (3) Liverman
1963–64 and alternate years. Theory of generalized functions in one variable. Operational calculus of generalized functions. Applications to differential equations and Fourier analysis. Prerequisite: Mathematics 140.

262 *Advanced Operational Methods* (3) Liverman
1963–64 and alternate years. Generalized functions on test spaces of analytic functions. Operational calculus in several variables. Applications to partial differential and convolution equations of applied mathematics. Prerequisite: Mathematics 261.

265–66 *Modern Algebra* (3–3) Wiegmann
Academic year—evening. Fundamental concepts of theory of groups, rings, and fields. Theory of finite fields, extension fields, Galois groups, factorization theory in Gaussian domains, and groups with operators.

267 *Topics in Matrix Theory* (3) Wiegmann
Not offered 1962–63. Theory of linear transformations (vector spaces over a division ring), advanced classical theory, matrix representation of groups and rings, special topics as time allows. Prerequisite: Mathematics 124 and an elementary knowledge of groups, rings, and fields.

268 *Calculus of Variations* (3)
Not offered 1962–63.

270 *Tensor Analysis* (3)
Not offered 1962–63.

272 *Hilbert Space* (3)
Spring—evening.

277 *Partial Differential Equations* (3)
Spring—evening.

281–82 *Introduction to Topology* (3–3) Kenyon
Academic year—evening.

295–96 *Reading and Research* (3–3) The Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

MEDICINE*

Professors T. M. Brown *(Chairman)*, M. J. Romansky, L. K. Alpert, J. M. Evans, C. B. Ethridge

Associate Professors A. E. Parrish, C. R. Hartman

Associate Clinical Professors Pearl Holly, J. J. Feffer, A. G. Prandoni, Halla Brown, O. R. Farley, D. C. Sun, Janet Travell, T. S. Sappington

Assistant Professors S. W. Bush, W. R. Felts, Jr., G. A. Kelser, Jr., M. H. Jacobson, H. H. Orvis, Irene Siu, R. C. Fowler, Ariel Hollinshead *(Research)*, Mary Watt

Assistant Clinical Professors J. A. Reed, T. J. Abernethy, Benjamin Manchester, J. E. Smith, J. W. Trenis, L. E. Putnam, Elizabeth Hill, J. E. Rall, L. J. Thomas, M. H. Stolar, Alfred Brigulio, S. J. N. Sugar, Joseph Ney, Joseph Beinstein, F. S. Bacon, H. D. Ecker, J. J. Rheingold, Irene Tamagna, J. W. Latimer, Jr., C. W. Jones, C. W. Thompson, E. S. Gladsden, Maurice Mensh, Arthur Rosenbaum, F. J. Murray, E. P. Parker III, M. H. Rosenberg, J. W. DuChez, W. O. Bailey, Jr., Milton Gusack, Jack Kleh, T. A. Gonder, Rashid Massumi, Ruth Benedict, H. M. Silver, H. E. Ticktin, J. P. Nasou, David Horwitz, B. C. Jones, Jr., E. L. Kehoe, R. F. Manegold, W. H. Whitmore, Jr.

Associates Maurice Protas, R. B. Castell, S. T. Gibson, R. B. Miller, Ernest Cotlove, T. J. Kennedy, Jr., Jack Orloff, J. B. Marbury, Louis Ross, F. D. Chapman, L. H. Snyder, R. G. Taylor, J. W. Long, Irvin Kerlan, Virginia Beelar, L. S. Blumenthal, S. W. Kirstein, J. F. Ambury, R. N. Coale, Israel Kessler, W. D. Brill, Marvin Fuchs, W. J. Weaver, Jr., J. T. Burns, T. L. Hartman, Boris Rabkin, M. H. Rose, C. A. Schulman, L. A. Craig, Jr., A. W. Danish, Adolph Friedman, Alvin Seltzer, S. D. Loube, Alfred Baer, Herbert Abramson, J. H. Pert, John Walsh, C. E. Law, E. L. Rea, J. P. Mann, Conrad Gossels, H. O. Mott, Bertle Nelson, W. J. Schewe, J. H. Watson, N. H. Rubenstein, D. M. Watkin, Edward Adelson, G. J. Fisher, W. L. Stone, B. H. Ostrow, C. D. Cooper, R. R. Belton, S. C. Pascoe, W. R. Ehrmantraut, C. A. Caceres, G. A. Chapman, F. M. Gross, Eleanor Makel, S. A. Babin, Jr., Alice Brigham

Instructors N. C. Kramer, W. F. Morrissey

Clinical Instructors E. H. Bauersfeld, H. C. Bates, Jr., Jeanne Bateman, George Sharpe, William Lewis, M. A. Sislen, C. J. Savarese, Jr., B. R. Cooperman, M. G. Sherer, J. C. Mandes, R. L. Howard, Walter Kurland†, E. J. Leonard, R. S. Gordon, Jr., Jack Crowell, D. S. Davis, J. W. Roark, J. H. Epstein, G. C. Buchanan, F. K. Harris II, Audrey Connor, H. I. Passes, C. W. Foulke, Margret McCabe, A. A. Lear, O. W. Donnelly, R. F. Dyer, R. S. Poole, P. R. Vagelos, H. C. Sadin, S. J. Talpers, G. T. Economos, Irwin Ardam, S. W. Dejter, S. E. Barr, H. A. Moskovitz, J. T. Hagenbucher, G. N. Polis, J. L. Clifford, Daniel Deykin, Catherine Ray, H. G. Rose, Sammye Belcher, Morton Gluck, A. W. McLaurin, R. A. Olsson, Robert Steinmuller

Special Lecturers A. D. Kistin, W. K. Myers, Sol Katz, R. W. Berliner, T. H. McGavack, P. D. Comanduras, W. L. Nalls, Roy Hertz, Albert Sjoerdsma, W. H. Crosby, D. S. Frederickson, Pierre Tulou, J. L. Goddard

236 *Clinical Microscopy* The Staff

Spring—3 hours a week. Conferences and studies in the clinical application of laboratory examinations of blood, body fluids, exudates, excreta.

* The Staff of Instruction here listed is for the academic year 1961–62.

† On military leave 1961–62.

242 *Physical Diagnosis* — The Staff
Spring—6 hours a week. Covers not only theoretical but practical application of principles of physical diagnosis as related to examination of patients.

243–44 *Introduction to Medicine* — The Staff
Academic year—2 hours a week. Lectures covering the principles of internal medicine preparatory to clinical studies and training in the inpatient and outpatient services.

325–26 *Clinical Clerkship* — The Staff
Eight weeks as arranged during academic year. Training with bed patients under individual instruction designed to develop ability in examination of patients and case taking as well as practice in clinical microscopy. D. C. General Hospital.

327 *Clinical Pathological Conferences I* — The Staff
Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are compared.

339–40 *Therapeutic Conferences* — The Staff
Academic year—1 hour a week. Conferences designed to emphasize the application of pharmacological principles to the problems of clinical medicine. University Hospital.

349–50 *Medical Conferences* — The Staff
Academic year—2 hour a week. D. C. General Hospital.

421–22 *Outpatient Clinics* — The Staff
Six weeks as arranged during academic year. Individual case studies under personal supervision of the Staff. Daily clinics on current medical problems and seminars stressing physiological aspects of diseases. Individual examinations and instruction in medical specialties. University Hospital.

423–24 *Clinical Clerkship* — The Staff
Six weeks as arranged during academic year. University, Mt. Alto, and D. C. General hospitals.

427–28 *Clinical Pathological Conferences II* — The Staff
Academic year—1 hour a week. Continuation of Medicine 327.

429–30 *Clinical Pathological Conferences III* — The Staff
Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during their medical clerkships there.

MICROBIOLOGY*

Professors R. C. Beachley *(Emeritus)*, A. M. Griffin, Mary Robbins *(Acting Chairman)*, R. C. Parlett
Clinical Professor Murray Grant
Associate Professor Rudolph Hugh
Assistant Professor R. C. Wood
Clinical Instructor A. H. Traum
Associates W. D. Hann, G. B. Pelleu, Jr.

Special Lecturers L. S. Baron, R. C. Cook, C. W. Emmons, F. B. Gordon, Leon Jacobs, M. C. Leikind, J. D. MacLennan, H. J. Magnuson, W. J. Peeples, C. O. Pierce

* The Staff of Instruction here listed is for the academic year 1961–62.

Master of Arts or *Master of Science in the field of Microbiology.*—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree, respectively, from this University, or the equivalent, with a major in Biology, Botany, Chemistry, or Zoology. The undergraduate program must include the following courses or the equivalent: Biology 1–2*, Chemistry 11–12, 21, 22, 151–52; Physics 11, 12; Zoology 103–4 (formerly 41–42).

Required: the general requirements, pages 64–66. The thirty semester hours must include (if not presented for admission) Microbiology 112, 249–50, 293–94, 299–300 and Biochemistry 221–22. The remaining courses are to be selected from Microbiology 209, 219–20, 225, 232, 234, 240 and 295–96. The student with much bacteriological background may substitute for credit one or more courses from the following: cytology, genetics, cell physiology, entomology, histology, biostatistics, and protozoology. It is not always possible to arrange courses and research so that the student can be assured of completing all required work in one academic year.

Doctor of Philosophy.—See pages 67–73.

112 *General Microbiology* (4) Hugh

Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M. For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications. Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11–12. Laboratory fee, $13.

209 *Medical Microbiology* (1 to 11) The Staff

Fall: lecture (4 hours), laboratory (10 hours)—as arranged. Bacteria, rickettsiae, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsiae and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, $4.50 for each semester hour of laboratory work.

210 *Fundamentals of Epidemiology and Preventive Medicine* (2) Grant

Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Microbiology 112 or 209.

219–20 *Advanced Microbiology* (arr.) Hugh and Staff

Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Microbiology 112 or 209; Chemistry 151–52 or the equivalent; permission of the instructor. Laboratory fee, $4.50 a semester hour.

225 *Bacterial Chemistry and Physiology* (2) Wood

1963–64 and alternate years: fall—as arranged. A lecture course in those areas of biochemistry peculiar to Class Schizomycetes, including discussion of the use of bacteria in the elucidation of biochemical problems. Prerequisite: Biochemistry 221–22 or the equivalent. A course in microbiology is recommended but is not essential.

232 *Immunological Methods* (3) The Staff

1962–63 and alternate years: spring—as arranged. Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $11.

234 *Virology* (6) Robbins

1963–64 and alternate years: spring—as arranged. Study of viruses and rickettsiae. Lectures and laboratory exercises. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $16.

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

240 *Advanced Epidemiology* (3) — The Staff

Spring—as arranged. Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Microbiology 210. Prerequisite: Microbiology 210.

249–50 *Introduction to Medical Research** (3–3) — The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

293–94 *Staff Seminar* (1–1) — The Staff

Academic year as arranged. For graduate students. Bi-weekly throughout the year.

295–96 *Research in Microbiology* (arr.) — The Staff

Academic year—as arranged.

299–300 *Thesis* (3–3) — The Staff

NEUROLOGY AND NEUROLOGICAL SURGERY†

Professors J. W. Watts *(Chairman)*, Harold Stevens
Associate Professor R. S. Paine
Associate Clinical Professors R. H. Groh, J. M. Williams, J. F. Fazekas
Assistant Clinical Professors J. P. Murphy, H. V. Rizzoli, A. S. Dekaban, Harvey Ammerman, G. J. Hayes
Associates G. D. Weickhardt, C. A. Marsan, A. J. Levens
Clinical Instructors M. C. Korengold, J. T. Lord, N. H. Horwitz, Z. W. Sanders, Ntinos Myrianthopoulos, R. H. Robertson, R. A. Mendelsohn, Ruth Jakoby, Virginia Duggins, L. C. McHenry, Jr., A. P. Hustead

249 *Neurology: Basic* — Stevens, Williams

Fall—1 hour a week. Methods used to study the form and function of the nervous system. Lectures and laboratory demonstrations.

250 *Neurology* — Stevens and Staff

Spring—1 hour a week. Introductory lectures on clinical neurology with specimens, lantern slides, and motion pictures.

331 *Neurology and Neurological Surgery* — Watts, Stevens

Fall—1 hour a week. Clinical lectures and demonstrations.

333–34 *Neurology and Neurological Surgery, Clinical Clerkship* — Stevens, Williams, Ammerman

In conjunction with Neurology 335–36. Two weeks in rotation as arranged during academic year. Instruction in history, physical examination, ordinary clinical procedures. Attendance at neurosurgical operations. Six students in rotation. D. C. General Hospital.

335–36 *Neurosurgical Conferences* — Watts and Staff

Clinical conferences weekly. Six students in rotation. D. C. General Hospital.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1961–62.

431–32 *Neurology and Neurological Surgery Clinic* — Levens, Rizzoli

Two hours a week for three weeks in rotation as arranged during academic year. Neurological outpatient clinic. Consultation of staff on ambulatory cases, demonstration of diagnostic procedures. Six students in rotation. University Hospital.

433–34 *Clinical Neurology* — Groh, Sanders

Two hours a week for three weeks in rotation as arranged during academic year. Neurological inpatient examinations and demonstrations. Six students in rotation. St. Elizabeths Hospital.

435–36 *Neurological Surgery (elective)* — The Staff

Academic year—bi-monthly Lectures and motion picture demonstration of neurosurgical problems.

OBSTETRICS AND GYNECOLOGY*

Professors John Parks, R. H. Barter *(Chairman)*
Clinical Professor George Nordlinger
Associate Clinical Professor S. M. Dodek
Assistant Professors J. G. Sites, W. P. McKelway
Assistant Clinical Professors J. K. Cromer, J. A. Dusbabek, C. K. Fraser, Caroline Jackson, T. M. Leonard
Associates B. W. Richwine, F. S. Rogers, R. M. Roll, W. T. Lady, J. W. Pearson, Jr., Shirley Martin, N. J. Price, T. A. Wilson, M. S. Kaufman, M. P. Footer, J. C. Walsh
Clinical Instructors J. R. Epstein, S. H. Shea, A. S. Bright, R. E. Bieren, Donald Walters, J. M. Friedman, L. M. Liverett, W. H. Cooper, Peter Soyster, H. P. Treichler, I. W. Rovner, M. W. Sandmeyer, Jr., N. M. Tart, Elizabeth Crisp, L. W. Davis, J. F. Pauly, A. W. Winshel

254 *Introduction to Obstetrics and Gynecology* — Dodek, Fraser

Spring—1 hour a week. Lectures and demonstrations on the development and physiology of the female reproductive system and management of normal pregnancy.

301–2 *Manikin Demonstrations* — Footer, Friedman

One hour a week for six weeks in rotation as arranged during academic year. The mechanism of labor and various types of operative delivery demonstrated to sections of the junior class. D. C. General Hospital.

337–38 *Obstetrics and Gynecology* — Parks, Barter, Sites, McKelway

Academic year—2 hours a week. Lectures and demonstrations on the principles of obstetrics and gynecology.

351–52 *Clinical Clerkship* — The Staff

Four weeks during academic year as arranged. Clerkship with patients, including ward rounds, operating room demonstrations, and weekly clinic. D. C. General Hospital.

441–42 *Clinical Obstetrics* — The Staff

Academic year—as arranged. Students participate in prenatal and postnatal clinic care, observe the course of labor and deliver patients under supervision, attend bi weekly departmental conferences and daily ward rounds in the University and D. C. General hospitals.

* The Staff of Instruction here listed is for the academic year 1961–62.

443–44 *Clinical Gynecology* — The Staff
Six weeks in rotation as arranged during academic year. Students observe and participate in the gynecological clinics and operating rooms of the University and D. C. General hospitals.

OPHTHALMOLOGY *

Professor R. A. Cox *(Chairman)*
Clinical Professor E. A. W. Sheppard
Assistant Clinical Professor R. W. Wilkinson
Associates W. J. Romejko, W. P. Chalfant, Jr., W. J. G. Davis, R. E. duPrey, Robert Day, M. G. Alper
Clinical Instructors J. H. Lodge, W. B. Glew, J. R. Weimer, J. W. McTigue

352 *Ophthalmology* — The Staff
Spring—one hour a week for sixteen weeks as arranged. Lecture course presenting aspects of all the principles of ophthalmology.

447–48 *Clinic* — The Staff
Academic year—as arranged. Each student is given individual instruction in ophthalmological diagnosis.

OTOLARYNGOLOGY*

Associate Clinical Professor J. J. McFarland, Jr. *(Chairman)*
Assistant Clinical Professors Catharine Birch, J. L. Levine
Associates M. E. Krucoff, W. B. Walters†, R. S. Page, Jr., J. A. Sabri, W. M. Trible

351 *Otolaryngology* — The Staff
Spring—1 hour a week for fourteen weeks. Lectures and demonstrations on anatomy, physiology, and diseases of the ear, nose, and throat.

354 *Bronchoscopy* — The Staff
Spring—1 hour a week for two weeks. A series of lectures on the fundamental principles and the use of instruments, including both the bronchoscope and esophagoscope.

355–56 *Clinic* — The Staff
One and one-half hours a week in rotation as arranged during academic year. Practical and clinical instruction in the diagnosis and treatment of diseases of the ear, nose, and throat. University Hospital.

PATHOLOGY*

Professors T. M. Peery *(Chairman)*, W. R. Duryee *(Research)*
Clinical Professor D. L. Weiss
Associate Professors F. N. Miller, Jr., William Newman, W. L. Marsh
Assistant Professors Lois Platt *(Cytology)*, Alexander Breslow, John Culberson

* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence 1961–62.

Special Staff for Demonstrations

Associate Clinical Professors J. S. Howe, E. F. Geever, R. G. Gottschalk
Assistant Clinical Professors R. E. Palmer, W. F. Enos, Cornelia Hoch-Ligeti
Associates L. E. Zimmerman, L. W. Fix, C. B. Cook
Clinical Instructors D. R. Parkinson, I. D. Godwin

Special Lecturers E. B. Helwig, L. C. Johnson

Bachelor of Science in Medical Technology (Departmental).—Prerequisite: the Science curriculum, pages 53, 54, including Biology 1–2*, Chemistry 11–12, and Microbiology 112. Required: the general requirements, pages 58–60, 62, including Chemistry 21 and 22, and the following second-group courses offered in the University Hospital: Pathology 115–16, 117–18, and 119–20.

Doctor of Philosophy.—See pages 67–73.

115–16 *Introduction to Medical Science* (1–1) Marsh and Staff

Academic year—1 hour a week. For students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.

117–18 *Principles in Medical Technology* (4–4) Marsh and Staff

Academic year—4 hours a week. For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry, clinical bacteriology, serology, hematology, and clinical microscopy.

119–20 *Medical Technology Laboratory* (10–10) Marsh and Staff

30 hours a week for 50 weeks. Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.

259–60 *Pathology* Peery, Miller, Breslow, Culberson

Fall—9 hours a week; spring—3 hours a week. General pathology of inflammations, degenerations, malformations, and neoplasms. Special pathology of the organs and specific diseases. The laboratory work consists of the gross and microscopic study of diseased tissue. Special emphasis is placed on the functional effects of the various pathologic changes and their correlation with symptoms and physical signs.

261–62 *Necropsy* The Staff

Academic year—as arranged. Students are required to attend and assist in the performance of necropsies at the University Hospital.

263–64 *Demonstrations in Pathology* Special Staff

Academic year—1 hour a week. Gross specimens from several hospitals are demonstrated and discussed. The University hospital laboratories for clinical pathology are visited and their functions are demonstrated.

267–68 *Seminars in Pathology* The Staff

Academic year—as arranged. Advanced lectures are presented as arranged on special topics in pathology.

270 *Forensic Pathology and Medical Jurisprudence* Miller

Spring—1 hour a week. Forensic pathology, toxicology, chemistry, and immunology. The legal and ethical rights and responsibilities of physicians. Legal problems in medicine.

281 *Problems in Experimental Cellular Pathology* (1) Duryee

Fall—1 hour a week as arranged. For nonmedical graduate students. Also for a limited number of specially qualified medical students on an elective basis. Cytological and biophysical aspects of cellular function in relation to normal and selected pathological conditions.

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* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

323–24 *Surgical Pathology I* — Weiss

Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing current surgical specimens.

327 *Clinical Pathological Conferences I* — The Staff

Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are correlated.

427–28 *Clinical Pathological Conferences II* — The Staff

Academic year—1 hour a week. Continuation of Pathology 327.

429–30 *Clinical Pathological Conferences III* — The Staff

Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during the medical clerkship there.

492 *Surgical Pathology II* — Newman

Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

493–94 *Pathology Clerkship (elective)* — The Staff

Academic year—as arranged. A limited number of students receive individual training in surgical pathology and necropsies in the laboratories of the University Hospital.

PEDIATRICS*

Clinical Professors Margaret Nicholson, W. S. Anderson, R. H. Parrott, L. E. Hoeck, W. A. Howard *(Chairman)*

Associate Clinical Professors J. A. Washington, R. S. Lourie, T. E. Reichelderfer

Assistant Clinical Professors Margaret Gutelius, Mabel Grosvenor, Aaron Nimetz, George Maksim, A. B. Coleman, R. E. Martin

Associates J. H. Peacock, Jr., Mary Sartwell, C. F. Stiegler, H. G. Clark, Adrian Recinos, Jr., C. R. Webb, William Stark, A. R. MacPherson, S. L. Leikin

Clinical Instructors H. H. Diamond, R. H. Mitchell, R. O. Warthen, Emilie Black, R. H. Anderson, W. G. Preisser, Bennett Olshaker, H. T. Yates, Roger Bergstrom, G. J. Cohen, Mary Fox, S. Z. Goldblatt, Hilary Millar, Harold Plotsky, A. J. Modlin, J. R. Puig, Jean Lockhart, G. W. Daisley, Jr., Gloria Eng, Belinda Straight, Jean Yacoubian, T. H. Anders, Sidney Levin, Stephen Mourat

256 *Pediatrics* — Howard and Staff

Spring—2 hours a week. Lectures on physiology of the newborn, normal behavior, emotional and physical development, infant nutrition, diseases of the newborn, common anomalies and system illnesses of infancy and childhood. Medical School.

355–56 *Pediatrics* — Howard and Staff

Continuation of 256, with increasing emphasis on pathologic disease states, stressing pathophysiology and treatment.

357–58 *Clinical Clerkship: General Pediatrics* — Reichelderfer and Staff

Two weeks as arranged during academic year. Introduction to clinical pediatrics. Emphasis on bedside discussion and group seminars including the newborn. Ward rounds. Five students in rotation. D. C. General Hospital.

359–60 *Clinical Clerkship: Contagious Diseases* — Reichelderfer and Staff

Two weeks as arranged during academic year. Conferences and bedside discussion on contagious and infectious diseases. Prevention and quarantine measures. Five students in rotation. D. C. General Hospital.

* The Staff of Instruction here listed is for the academic year 1961–62.

361–62 *Clinical Conferences I* — Reichelderfer and Staff
Academic year—1 hour a week. Required. Presentation and discussion by students of current patient problems. D. C. General Hospital.

363–64 *Ward Rounds* — Reichelderfer and Staff
Academic year—as arranged. Bi-weekly ward rounds, with students and Resident Staff. D. C. General Hospital.

365–66 *Pediatric Psychiatry* — Lourie and Staff
Academic year—as arranged. Lectures on neuroses of children and adolescents (in cooperation with the Department of Psychiatry).

457–58 *Clinical Clerkship* — Howard and Staff
Six weeks as arranged during academic year. Full time, including assignment to night and holiday admissions. Case studies on wards under direct Resident supervision. Ward rounds with Staff and Residents. Twelve students. Children's Hospital.

459–60 *Outpatient Clinics* — Howard and Staff
Academic year—as arranged. Work in Medical and Specialty clinics including surgery, allergy, X-ray, child welfare, cardiology, dermatology, neurology, and child guidance. Children's Hospital.

461–62 *Clinical Pathological Conferences* — Howard and Staff
Academic year—1 hour a week. Clinical and pathological discussion of recent patient history and laboratory data. Medical School.

463–64 *Teaching Rounds* — Gutelius and Staff
Academic year—three times a week. Discussion of clinical problems of diagnosis and treatment of current patients. Children's Hospital.

465–66 *Section Conferences* — The Staff
Academic year—1 hour a week. Surgical diagnosis, pre- and post-operative management. Children's Hospital.

467–68 *Clinical Conferences II* — Howard and Staff
Academic year—1 hour a week. Required. Staff and student discussion of current problems in pediatrics with review of recent literature. Children's Hospital.

469–70 *Clinical Pediatric Psychiatry* — Lourie and Staff
Academic year—as arranged. Clerkship in fourth year including Well Baby Clinic. Group and class conferences.

PHARMACOLOGY*

Professor H. G. Mandel *(Chairman)*
Clinical Professor R. G. Smith
Professorial Lecturer B. B. Brodie
Associate Professor Clarke Davison
Assistant Professors V. H. Cohn, Jr., T. M. Farber, Paul Mazel, Melvin Reich *(Research)*, J. F. Henderson *(Research)*, George Fiala *(Research)*, Elizabeth Tidball *(Research)*

Master of Arts* or *Master of Science in the field of Pharmacology.—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively. The undergraduate program must include the following courses or the equivalent: Biology 1-2†; Physics 12, 13, 16; Chemistry 11–12, 22, 151–52. Biochemistry 221–22 and Physiology 137 are recommended as the undergraduate electives if the candidate wishes to complete the work for the Master's degree in one year.

* The Staff of Instruction here listed is for the academic year 1961-62.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

Required: the general requirements, pages 64–66, including Biochemistry 221–22; Physiology 137; Pharmacology 249–50, 261, 263, 267–68, 269–70, 299–300. The remaining courses may be selected from Biochemistry 224, 225–26, 232, 241; Physiology 170, 232; Microbiology 112, 209, 225, 230; Pharmacology 279–80.

Doctor of Philosophy.—See pages 67–73.

249–50 *Introduction to Medical Research** (3–3) The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

261 *Pharmacology* (5) The Staff

Fall—5 hours a week. Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students.

262 *Pharmacology* (1) The Staff

Spring—1 hour a week. Continuation of Pharmacology 261. Pharmacological uses of normal body constituents.

263 *Pharmacology Laboratory* (1) The Staff

Fall—3 hours a week. Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students.

267–68 *Pharmacological Research* (arr.) The Staff

Academic year—as arranged. Primarily for those properly qualified graduate and medical students seeking careers in pharmacology.

269–70 *Pharmacology Seminar* (1–1) The Staff

Academic year—2 hours a week. Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students.

279–80 *Mechanism of Drug Action* (1–1) The Staff

Academic year—as arranged. A course to familiarize the student with advanced biochemical, microbiological, and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students.

299–300 *Thesis* (3–3) The Staff

Academic year—as arranged. Required of Master of Arts and Master of Science candidates.

PHARMACY†

Professors C. W. Bliven‡, R. M. Leonard *(Acting Chairman)*
Associate Professors C. J. Kokoski, S. M. Schwartz, F. D. Cooper
Assistant Professor G. G. Koustenis

Special Lecturers W. S. Apple, G. F. Archambault, Karl Bambach, W. P. Briggs, C. J. Carr, E. G. Feldmann, D. L. Finucane, L. E. Kazin, Henry Miller, M. L. Yakowitz

Bachelor of Science in Pharmacy.—Prerequisite: the Pharmacy curriculum, see page 54. The requirements for the degree are stated on pages 115–17.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1961–62.

‡ On leave of absence 1961–62.

SECOND GROUP

100 *Introductory Pharmacy* (1) — The Staff
Fall: lecture and field trips—day. Introduction to pharmacy through the study of professional areas in which pharmacists are employed. Field trips include visits to representative retail and hospital pharmacies, wholesale drug houses, and museums.

101 *Inorganic Pharmaceutical Chemistry* (3) — Schwartz
Fall: lecture (2 hours), laboratory (3 hours)—day. A study of the occurrence, methods of preparation, properties and uses of the important inorganic chemicals encountered in pharmacy and medicine. Prerequisite: Chemistry 21. Laboratory fee, $11.

102 *Dispensing Pharmacy* (4) — Kokoski, Koustenis
Fall: lecture (2 hours), laboratory (6 hours)—day. Compounding of typical prescriptions and a study of incompatibilities. Prerequisite: Pharmacy 110, 111, 122. Laboratory fee, $18.

103 *Dispensing Pharmacy* (4) — Kokoski, Koustenis
Spring: lecture (2 hours), laboratory (6 hours)—day. Continuation of Pharmacy 102. Laboratory fee, $18.

107 *Pharmacy Accounting* (3) — Koustenis
Fall—day. The financial records required in the operation of a pharmacy.

109 *First Aid* (1)
Fall—day. Standard course in first aid methods and practice.

110 *Organic Pharmaceutical Chemistry* (3) — Schwartz
Fall—day. A survey of important synthetic and naturally occurring medicinal agents in current use with emphasis on nomenclature, isolation or synthesis, properties, and structure-action relationship. Prerequisite: Chemistry 152.

111 *Organic Pharmaceutical Chemistry* (3) — Schwartz
Spring—day. Continuation of Pharmacy 110. Prerequisite: Pharmacy 110.

112 *Physical Pharmacy* (4) — Schwartz
Spring: lecture (3 hours), laboratory (3 hours)—day. Physicochemical principles and laws as they apply to pharmaceutical systems and preparations. Prerequisite: Pharmacy 101 and 110; concurrent registration: Pharmacy 111. Laboratory fee, $11.

113 *Organic Pharmaceutical Chemistry* (1) — Schwartz
Laboratory (3 hours). Fall—day; spring—day. Preparation of selected official organic drugs. Prerequisite: Pharmacy 110. Prerequisite or concurrent registration: Pharmacy 111. Laboratory fee, $11.

115 *History of Pharmacy* (3) — Bliven
Fall—day. Historical development of the profession, including the literature, from ancient times to the present.

121–22 *General Pharmacy* (4–4) — Kokoski, Cooper, Schwartz
First half: fall—lecture (3 hours), laboratory (3 hours)—day. *Second half:* spring—lecture (2 hours), laboratory (6 hours)—day. Essential pharmaceutical processes; theory and manufacture of pharmacopeial and formulary galenical preparations; pharmaceutical usage of certain classes of substances and preparations. Laboratory fee: Pharmacy 121, $11; Pharmacy 122, $18.

125 *Pharmaceutical Calculations* (3) — Kokoski
Fall—day. Systems of weights and measures and their application in the practice of pharmacy.

126 *Pharmacognosy* (3) — Leonard
Fall: lecture (2 hours), laboratory (3 hours)—day. Practices and procedures for the production, preservation, protection, and evaluation of crude drugs; biosynthetic origin of drugs and pharmaceuticals, representative examples, and their value in pharmacy and medicine. Prerequisite: Biology 1–2*; Chemistry 151–52. Laboratory fee, $11.

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

127 *Pharmacognosy* (3) Leonard
Spring—day. Antibiotics, immunologic agents, allergens, hormones, vitamins, and pesticides. Prerequisite or concurrent registration: Microbiology 112; Physiology 137.

164 *Introduction to Pharmacology* (3) Leonard
(This course is being offered for the last time spring semester 1963.)
Spring—day. Limited to transfer students enrolled in the five-year program prior to the offering of Physiology 137, 160, and 170. Historical development, literature, and general principles of pharmacology; general anatomical, physiological, and pharmacological considerations of the autonomic, central, and somatic nervous systems; cardiovascular, gastrointestinal, and genitourinary systems; skin and mucous membranes. Prerequisite: Physiology 115; Biology 2*. Prerequisite or concurrent registration: Biochemistry 221–22.

165–66 *Pharmacology* (4–4) Leonard
First half: fall—lecture (4 hours), day. *Second half:* spring—lecture (3 hours), laboratory (4 hours), day. Drugs acting on the autonomic, central, and somatic nervous systems; cardiovascular, hematopoietic, genitourinary, endocrine, and digestive systems; histamine and antihistiminics; anti-infective agents; miscellaneous drugs; and their major clinical indications or therapeutic uses. Prerequisite: Biology 2*; Physiology 137 and 160 or 170; Microbiology 112; Biochemistry 221–22. Pharmacy 166: laboratory fee, $18.
For students in the four-year program who have completed Pharmacy 105 and 106 and those in the five-year program taking Pharmacy 164, Pharmacy 165 is a three-credit course; Pharmacy 166 is a three-credit course (lecture—2 hours, laboratory—4 hours). Biochemistry 221–22 is taken concurrently with Pharmacy 165–66.

167–68 *Pharmacology III* (3–3) Leonard
Not offered 1962–63. Laboratory work in pharmacological technique. Prerequisite or concurrent registration: Pharmacy 165. Laboratory fee, $18 a semester.

172 *Advanced Dispensing Pharmacy* (3) Kokoski
Spring—day. The study of special problems in dispensing pharmacy. Prerequisite: Pharmacy 103. Laboratory fee, $18.

174 *Quantitative Pharmaceutical Analysis* (3) Bliven, Schwartz
Spring: lecture (1 hour), laboratory (6 hours)—day. Drug analysis. Prerequisite: Chemistry 22. Laboratory fee, $18.

176 *Pharmaceutical Law* (3) Frailey
Spring—day. Students in the four-year program receive 2 semester hours of credit.

178 *Pharmacy Management* (3) Koustenis
Spring—day. Policies and operations relating to the management of pharmacy. Students in the four-year program attend 4 hours of lecture and receive 4 semester hours of credit.

184 *Special Problems in Pharmacy* (ART.) Kokoski, Schwartz
Fall—as arranged; spring—as arranged. Directed laboratory and library research on special problems in pharmacy and pharmaceutical chemistry. For selected undergraduate students. Prerequisite: Pharmacy 102 and 110. Fees to be arranged.

188 *Survey* (1) Leonard and Staff
Spring—day. A symposium covering the various phases of pharmacy.

190 *Hospital Pharmacy* (1) Cooper
Spring—day. Organization and functions of hospitals; organization and operation of a hospital pharmacy; professional and sickroom supplies. Prerequisite: Pharmacy 102.

192 *Hospital Pharmacy: Prescription Practice* (1) Cooper and Staff
Fall—as arranged; spring—as arranged; summer 1962. Prescription practice in the University Hospital Pharmacy. Prerequisite: Pharmacy 102.

* Offered by the department of Zoology.

194 *Manufacturing Pharmacy* (3) Cooper and Staff
Lecture (1 hour), laboratory (6 hours). Fall—as arranged; spring—as arranged. The manufacture of bulk pharmaceuticals in the University Hospital Pharmacy. Elective for seniors.

PHILOSOPHY*

Professor C. E. Gauss *(Chairman)*
Associate Professor R. H. Schlagel
Lecturer C. H. Pfuntner

Bachelor of Arts with a major in Philosophy (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, pages 52–53.

Required: in addition to the general requirements, pages 58–62, the grade of "pass" for the Philosophy major examination at the end of the senior year. The coordinated knowledge upon which the student will be examined is schematized under the following two general headings: (1) methodology and theory of knowledge and (2) the history of ideas and social philosophy. The Department of Philosophy provides a proseminar (Philosophy 199–200) intended to assist the student in preparing for the major examination.

Master of Arts in the field of Philosophy.—Prerequisite: an undergraduate major in Philosophy at this University or the equivalent, as attested by the passing of this University's major examination in Philosophy; the following specific courses or the equivalent: Philosophy 111–12, 113, 121–22, and 131.

Required: the general requirements, pages 64–66. As much as possible of the required course work must be in third-group courses. Where second-group courses are elected students will be required to do more intensive and extensive work than undergraduates. A general written examination in two areas of Philosophy and an oral examination in the student's special field will be required in addition to a Master's thesis of substantial length.

First Group

51–52 *Introduction to Philosophy* (3–3) The Staff
Academic year—day and evening; summer 1962—Philosophy 51 (3). A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.

Second Group

101 *Philosophic Problems in Living Issues* (1) Gauss
Not offered 1962–63. Selected public issues used as the basis for demonstrating the methods and relevance of philosophical analysis. This course may be reelected for credit once only.

111–12 *History of Philosophy* (3–3) Pfuntner
Academic year—evening. The history of western philosophy from early Greece to Kant, seen as the development and modification of the Hellenic cultural pattern.

113 *History of Nineteenth and Twentieth Century Philosophy* (3) Pfuntner
Fall—evening. European philosophy from the time of Kant. "Isms" and ideologies at the root of contemporary thought.

121–22 *Logic and Scientific Method* (3–3) Gauss
Academic year—day. *First half:* the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of

* The Staff of Instruction here listed is for the academic year 1961–62.

symbolic logic, the nature of a formal system. *Second half:* general analysis of the methods of investigation and reasoning used in the natural and social sciences, procedures and requirements of definition, classification and sorting, analogical and inductive inference, causal determination, the nature and function of hypothesis, measurement, principles of the theory of probability.

131 *Ethics* (3) Schlagel
Fall—evening. A critical examination of traditional ethical theories from Plato to Ayer. Consideration of the theoretical problems of ethics: the meaning of "good", the nature of ethical judgment, the justification of ethical standards. The course aims at enabling the student to develop his own ethical view as a consequence of his greater understanding of moral phenomena.

142 *Philosophies Men Live by* (3) Schlagel
Spring—evening. Critique of the tenets, methodologies, and presuppositions of current, vital philosophical orientations: Existentialism, Positivism, Pragmatic Naturalism, Theism, Linguistic Analysis. A critique of reason and faith, and the nonrational aspects of man as guiding influences in life.

151 *The Philosophy of Science* (3) Schlagel
Fall—day. Brief history of modern science; problems of the meaning of causality, the justification of induction, theories of probability; the nature of scientific explanation and the status of inferred entities; the nature of a mathematical system. Consideration of the philosophic import of certain scientific theories such as Einstein's theory of relativity, Heisenberg's principle of indeterminacy, and Bohr's principle of complementarity.

152 *Epistemology* (3) Schlagel
Spring—day. The meaning and criteria of truth; the meaning and cognitive significance of common sense, scientific, and religious propositions or beliefs. Study of problems related to perception, verification, universals, *a priori* and *a posteriori* knowledge, the concept of mind.

162 *Aesthetics* (3) Gauss
Spring—day. The nature of aesthetic experience, problems of appreciation and judgment in the arts, and of the theories and process of artistic creation. Emphasis on contemporary arts and criticism.

172 *American Philosophy* (3) Pfuntner
Spring—evening; summer 1962. The philosophies of Peirce, Royce, James, Dewey, and Santayana as representative of American thought.

180 *Philosophy of History* (3) Gauss
Fall—day. Problems of historical knowledge and explanation. Critique of philosophies of history.

193 *Topics in Contemporary Philosophy* (3) Gauss
Summer 1962. Intensive study of one selected topic in contemporary philosophic literature.

199-200 *Proseminar: Readings for the Major* (3–3) Schlagel
Academic year—as arranged. Conferences and group discussions in preparation for field-of-study major examination.

THIRD GROUP

201–2 *Readings and Research* (3–3) The Staff
Academic year—as arranged. Advanced readings and reports. Investigation of special problems.

211 *Seminar in Plato* (3) Gauss
Spring—as arranged. Intensive study of Plato's later dialogues.

212 *Seminar in Aristotle* (3) Schlagel
Not offered 1962–63. Aristotle's logic, metaphysics, and philosophy of science.

216 *Seminar in Kant* (3) Schlagel
Not offered 1962–63. A study of one of Kant's Critiques.

262 *Seminar in Aesthetics* (3) Gauss
Not offered 1962–63. Intensive study in selected problems in the philosophy of art.

299–300 *Thesis* (3–3) The Staff

RELATED COURSES IN OTHER DEPARTMENTS

Classical Languages and Literatures 71–72, *Greek and Roman Backgrounds in Literature* (3–3)

Mathematics 101, *Introduction to Mathematical Logic* (3)

PHYSICAL EDUCATION FOR MEN*

Professors W. H. Myers, J. H. Krupa *(Chairman)*, R. G. Hanken, V. J. DeAngelis
Lecturers Pat Abernethy, W. D. Thompson

Associates W. J. Reinhart, J. V. Camp

This department includes all the recognized athletic activities of the men students of the University.

Two years of Physical Education (Physical Education 1–2 and 11–12) are required of all men for graduation, except those students exempt under the regulations stated on pages 41 and 42.

Upon entering the University, all freshmen or other undergraduate students who have not fulfilled the Physical Education requirements are given a medical examination. Assignments for medical examinations will be given at the time of registration. The students who satisfy the requirements of the medical examination are then given a physical efficiency test in the general body skills of agility, endurance, and strength; and in swimming. If the physical efficiency test is passed, the student may elect from the following list of activities:

Setting-up Exercises (stretching exercises)
Body Building Exercises (gymnastic apparatus and weight training skills)
Competitive games and sports
Swimming (beginner, intermediate, advanced, life saving)

If the physical efficiency test is not passed, the student will be assigned to a class for training in the above activities in the order listed.

The Department furnishes gynasium uniforms and personal equipment upon receipt of a small payment.

Bachelor of Science in Physical Education.—Prerequisite: the Physical Education for Men curriculum, page 55. The requirements for the degree are stated on pages 120, 122–23.

Bachelor of Arts in Education with (1) a major in secondary education combined with a teaching field in Physical Education and *(2) a major in elementary education with an area of specialization in Physical Education*, see the School of Education Catalogue.

FIRST GROUP

1–2 *Freshman Physical Education* (1–1) The Staff
Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,† $4.50 a semester.

* The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education, and the student assumes full responsibility therefor.
The Staff of Instruction here listed is for the academic year 1961–62.
† The locker and towel fee is required for registration in one or more of the activity courses.

11–12 *Sophomore Physical Education* (1–1) — The Staff
Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,* $4.50 a semester.

41 *Personal Health* (1) — Krupa
Spring—day. Physical, mental, and social health of the individual—understanding, significance, and promotion. Emphasis on personal health knowledges for the future teacher.

43–44 *Techniques of Physical Education Motor Activities* (2–2) — DeAngelis, Krupa
Academic year—day. Fundamental skills, rules, and organization. Locker and towel fee,* $4.50 a semester.

45–46 *Teaching Individual and Dual Sports in Secondary Schools* (2–2) — Hanken, Krupa
Academic year—day. Tennis, golf, swimming, wrestling, badminton, bowling. Locker and towel fee,* $4.50 a semester.

47 *Introduction to Physical Education* (2) — Myers
Fall—day. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field.

48 *Introduction to Recreation* (2) — Hanken
Spring—day. The role of recreation in modern living; current practices in community recreation work; standards of training, experience, and salary; types of leadership.

49 *Human Anatomy* (3) — Stallings
Fall—day. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1–2.†

50 *Kinesiology* (3) — Lawrence
Spring—day. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

58 *First Aid and Care of Athletic Injuries* (2) — DeAngelis
Spring—day. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1–2.†

SECOND GROUP

101 *Physical Education in the Elementary School* (3) — Burtner, Snodgrass
Fall—day; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

103 *History and Principles of Physical Education* (3) — Myers, Stallings
Fall—day. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

105–6 *Adapted Physical Education and Physical Examinations* (3–3) — Lawrence
Academic year—day. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises and program adaptation. Prerequisite: Physical Education 49 and 50.

* The locker and towel fee is required for registration in one or more of the activity courses. Students may
† An interdepartmental course offered by the departments of Botany and Zoology. register in either department.

107 *Teaching Recreational Dance* (1 to 2) **Burtner**
Fall—day. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary-school age and adult groups. Square-dance calling is included. Locker and towel fee,* $4.50.

109–10 *Leadership Organization in the Intramural Program* (2–2) **DeAngelis**
Academic year—day. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.

113–14 *Practice in Teaching Physical Education Activities* (2 to 4–2 to 4) **Hanken and Staff**
Academic year—day. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* $4.50 a semester.

115–16 *Teaching Team Sports in Secondary Schools* (2 to 4–2 to 4) **DeAngelis, Hanken**
Academic year—day. Football, basketball, baseball, track and field. Locker and towel fee,* $4.50 a semester.

117 *Teaching Modern Dance* (1 to 2) **Burtner**
1962–63 and alternate years: fall—day. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* $4.50.

118 *Dance Production* (1 to 2) **Burtner**
1962–63 and alternate years: spring—day. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* $4.50.

121 *School and Community Health Programs* (3) **Krupa**
Fall—evening. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1–2.†

122 *Methods and Materials for Health Education* (3) **Stallings**
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1–2.†

131 *Tests and and Measurements in Physical Education* (3) **Krupa**
Fall—day. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

132 *Camp Leadership* (1 to 2) **Stallings**
Spring—day. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.

136 *Survey of Dance History and Dance Forms* (3) **Burtner**
1963–64 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.

138 *Organization and Administration of Physical Education* (3) **Krupa**
Spring—evening. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

151–52 *Recreational Leadership Activities* (1 to 3–1 to 3) Abernethy
1963–64 and alternate years: academic year—evening. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.

161 *Community Organization for Recreation* (3) Thompson
1962–63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.

162 *Administration of Community Recreation Programs* (3) Thompson
1962–63 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

PHYSICAL EDUCATION FOR WOMEN*

Professors Helen Lawrence, Elizabeth Burtner
Associate Professor Loretta Stallings *(Chairman)*
Assistant Professors Lyndale George, Jeanne Snodgrass, Connie Vaughan, Anne Ingram
Lecturers Pat Abernethy, W. D. Thompson
Instructor Donna Abbey
Associate Mabel McEwan

Two years of Physical Education (Physical Education 1–2 and 11–12) are required of all women for graduation, except students exempt under regulations stated on pages 41–42. In the fall a medical and physical examination is given each student for the purpose of discovering individual needs. Those students whose examinations indicate the desirability of remedial or restricted activity are assigned to a program especially adapted to their needs. This limited program includes moderate sports and individual exercises in small groups under careful supervision.

The required costume for Physical Education classes may be purchased at the University Book Store.

Bachelor of Science in Physical Education.—Prerequisite: the Physical Education for Women curriculum, pages 55–56. The requirements for the degree are stated on pages 120, 123.

Within the curriculum leading to the degree of Bachelor of Science in Physical Education there is opportunity for specializing in dance, correctives, or recreation.

Bachelor of Arts in Education with (1) a major in secondary education combined with a minor teaching field in Physical Education and (2) a major in elementary education with an area of specialization in Physical Education, see the School of Education Catalogue.

First Group

1–2 *Freshman Physical Education* (1–1) The Staff
Academic year—day. One period of fundamentals of health and physical education and two periods a week chosen from the activities offered each semester.

Fundamentals of health and physical education: one semester on study of the factors involved in the general maintenance of health, efficient use of the body, and fundamentals of movement; one semester on fundamentals of dance.

Activities: badminton, basketball, body mechanics, field hockey, recreational dance, golf, fencing, modern dance, riding, skating, swimming, synchronized swimming, tennis, softball, lifesaving. Locker and towel fee,† $4.50 a semester.

* The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education, and the student assumes full responsibility therefor.
The Staff of Instruction here listed is for the academic year 1961–62.
† The locker and towel fee is required for registration in one or more of the activity courses.

11–12 *Sophomore Physical Education* (1–1) **The Staff**
Academic year—day. Two periods a week chosen from the activities offered each semester as listed under Physical Education 1–2. Locker and towel fee,* $4.50 a semester.

43–44 *Techniques of Physical Education Motor Activities* (2–2) **The Staff**
Academic year—as arranged. Fundamental skills, rules, and organization. Locker and towel fee,* $4.50 a semester.

49 *Human Anatomy* (3) **Stallings**
Fall—day. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1–2.†

50 *Kinesiology* (3) **Lawrence**
Spring—day. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

51–52 *Teaching Physical Education Activities* (2–2) **The Staff**
1963–64 and alternate years: academic year—day. Team sports: basketball, hockey, softball, soccer, speedball. Individual and dual sports: tennis, badminton, archery, swimming and diving, lifesaving and water safety. Gymnastics: tumbling apparatus and trampoline. Locker and towel fee,* $4.50 a semester.

58 *First Aid and Care of Athletic Injuries* (2) **DeAngelis**
Spring—day. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1–2.†

SECOND GROUP

101 *Physical Education in the Elementary School* (3) **Burtner, Snodgrass**
Fall—day; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, self-testing activities, and body mechanics.

103 *History and Principles of Physical Education* (3) **Stallings, Myers**
Fall—day. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

105–6 *Adapted Physical Education and Physical Examinations* (3–3) **Lawrence**
Academic year—day. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.

107 *Teaching Recreational Dance* (1 to 2) **Burtner**
Fall—day. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary school age and adult groups. Square-dance calling is included. Locker and towel fee,* $4.50.

111–12 *Teaching Physical Education Activities* (2–2) **The Staff**
1962–63 and alternate years: academic year—day. Continuation of methods and materials in activities listed under Physical Education 51–52. Locker and towel fee,* $4.50 a semester.

113–14 *Practice in Teaching Physical Education Activities* (2 to 4–2 to 4) **The Staff**
Academic year—as arranged. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* $4.50 a semester.

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

117 *Teaching Modern Dance* (1 to 2) **Burtner**
1962–63 and alternate years: fall—day. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* $4.50.

118 *Dance Production* (1 to 2) **Burtner**
1962–63 and alternate years: spring—day. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* $4.50.

121 *School and Community Health Programs* (3) **Krupa**
Fall—evening. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1–2.†

122 *Methods and Materials for Health Education* (3) **Stallings**
Spring—evening. Methods and materials for teaching health at each age level. Prereqisuite: Biology 1–2.†

131 *Tests and and Measurements in Physical Education* (3) **Krupa**
Fall—day. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

132 *Camp Leadership* (1 to 2) **Stallings**
Spring—day. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.

136 *Survey of Dance History and Dance Forms* (3) **Burtner**
1963–64 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.

138 *Organization and Administration of Physical Education* (3) **Stallings**
Spring—as arranged. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.

151–52 *Recreational Leadership Activities* (3–3) **Abernethy**
1963–64 and alternate years: academic year—evening. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.

161 *Community Organization for Recreation* (3) **Thompson**
1962–63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.

162 *Administration of Community Recreation Programs* (3) **Thompson**
1962–63 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

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* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

PHYSICAL MEDICINE AND REHABILITATION*

Professor C. S. Wise *(Chairman)*
Assistant Professor John Watt, Jr.
Assistant Clinical Professor P. A. Klieger
Associates A. B. C. Knudson, F. L. Wenger

150 *Elements of Physical Medicine* — The Staff

Spring—as arranged. In arrangement with the Anatomy Department, lectures and demonstrations of the various tests and measurements are employed in the evaluation of physical disability.

352 *Advanced Physical Medicine* — The Staff

Spring—1 hour a week. Lectures and demonstrations concerning the various techniques, clinical applications of physical medicine and rehabilitation to be integrated with the teaching of the associated medical and surgical specialties.

467–68 *Clinical Studies (elective)* — The Staff

Academic year—as arranged. Clinical teaching and demonstration at the University Hospital.

485 *Research* (arr.) — The Staff

Fall—as arranged. Open to medical students and qualified nonmedical students.

PHYSICS*

Professors C. M. Koehl, Lewis Slack†, Herbert Jehle
Associate Professor H. H. Hobbs *(Chairman)*
Associate Professorial Lecturers H. H. Landon, Jr., Herbert Rabin
Assistant Professors S. S. Yeandle, Jr., Margaret Montzka, J. P. Hollinger, G. C. Murray *(Research)*
Lecturers J. N. Tevis, DeWitt Fisher, J. M. Harrison, K. F. Oerlein, W. J. Condell, Jr., J. E. Tompkins

Bachelor of Arts or *Bachelor of Science with a major in Physics (Departmental)*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53, including Physics 11, 12, 13, 16; or 11, 14, 15, 16; Chemistry 21; Mathematics 29, 30, and 31 or Mathematics 21, 22, 23, and 24.

Students who started work toward a major in Physics prior to the reorganization of the introductory courses in Physics and Mathematics, which went into effect in the fall of 1959–60, may substitute Physics 5, 6, and 7 for Physics 11, 12, and 13; and Mathematics 19 and 20 for Mathematics 29, 30, and 31 or Mathematics 21, 22, 23, and 24.

Required, both for the Bachelor of Arts degree and the Bachelor of Science degree: the general requirements, pages 58–62, including Mathematics 112 and Physics 101, 105, 106, 113, 102 or 114, and 153, 155, or 156, plus *one* of the following: Physics 118, 123, and 132.

Master of Arts or *Master of Science in the field of Physics*—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Physics at this University, or the equivalent.

Required: the general requirements, pages 64–66, including Mathematics 171 (if not taken earlier) and Physics 201, 202, 219, 255 or 256, and 291–92.

Doctor of Philosophy.—See pages 67–73.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence spring semester 1961–62.

Bachelor of Science in Engineering with an option in Physics.—See pages 100–101, 103–4, 111–12.

Bachelor of Arts in Education with a teaching field in Physics.—Prerequisite: the Education curriculum, pages 54–55.

Required: the physics option and the professional courses listed in the School of Education Catalogue.

First Group

For a one-year course offering an introduction to the methods and achievements of physical science, see Chemistry 3–4, page 191.

11 *Introductory Physics* (3) — Koehl and Staff

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; spring—day and evening; summer 1962. An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, $11.

12 *Introductory Physics* (3) — Koehl and Staff

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Spring—day and evening; summer 1962. Mechanics, wave-motion, and sound. Prerequisite: Physics 11. Material fee, $11.

13 *Introductory Physics* (3) — The Staff

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; summer 1962. Elementary electricity and magnetism. Prerequisite: Physics 11. Material fee, $11.

14 *General Physics* (3) — The Staff

Lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours). Spring—day and evening. Mechanics, wave-motion, and sound. Prerequisite: Physics 11, Mathematics 29 or 21. Material fee, $11.

15 *General Physics* (3) — Hobbs and Staff

Lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours). Fall—day and evening. Electricity and magnetism. Prerequisite: Physics 14, Mathematics 30 or 22. Material fee, $11.

16 *General Physics* (3) — Hobbs

Lecture (2 hours), conference (1 hour). Spring—day and evening. Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30 or 22, and consent of the instructor.

Second Group

101 *Mechanics* (3) — Jehle

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Statics, elasticity, dynamics of solids and fluids, and gravitation. Prerequisite: Physics 12 or 14, Mathematics 31 or 24.

102 *Heat and Thermodynamics* (3) — Yeandle

Fall—evening. Fundamental concepts, heat transfer, the laws of thermodynamics with applications to physical systems. Prerequisite: Physics 16, Mathematics 31 or 24.

105 *Principles of Electricity* (3) — Hollinger

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Elementary d-c and a-c circuit theory, electric and magnetic fields, dielectric and magnetic materials, motion of charged particles in electric and magnetic fields. Prerequisite: Physics 16, Mathematics 31 or 24.

106 *Optics* (3) — Koehl

1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Geometrical optics; elementary theory of wave motions; interference, diffraction, polarization, and dispersion of light; laws of black-body radiation. Prerequisite: Physics 16, Mathematics 31 or 24.

113 *Atomic Physics* (3) Hobbs
1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Properties of elementary particles, interactions with radiation, atomic structure, optical and X-ray spectra, introduction to wave mechanics. Prerequisite: Physics 16, 101 or 105, or the equivalent, Mathematics 31 or 24.

114 *Statistical Physics* (3) Jehle
Spring—evening. Classical and quantum statistics with emphasis on Maxwell-Boltzmann statistics; applications to kinetic theory of gases, gaseous diffusion, specific heats of gases and solids. Prerequisite: Physics 16, Mathematics 31 or 24, permission of the instructor.

116 *Quantum and Solid State Physics* (3) Hobbs
Spring—day and evening. Primarily for engineers. Prerequisite: Physics 16, Mathematics 111.

118 *Introduction to Solid State Physics* (3) Rabin
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Dielectric and magnetic properties of solids, electron theory of metals, semiconductors, dislocations, and plastic flow. Prerequisite: Physics 113.

123 *Nuclear Physics* (3) Slack
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Structure and stability of atomic nuclei, nuclear transformations and reactions, radiations of nuclei, fission. Prerequisite: Physics 113.

128 *Sound* (3)
1963–64 and alternate years: spring—evening. Production, propagation, and detection of sound waves; vibrations of sounding bodies; acoustic instruments and acoustic measurements. Prerequisite: Physics 16, Mathematics 31 or 24.

132 *Electronics* (3) Hollinger
Lecture (2 hours), laboratory (3 hours). 1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications. Prerequisite: Physics 16 and a course in d-c and a-c circuits in Physics or Engineering. Material fee, $11.

153 *Advanced Laboratory in Atomic Physics* (3) Murray
Spring: Saturday—as arranged. Prerequisite: Physics 16. Material fee, $11.

155 *Advanced Laboratory in Electricity and Magnetism* (3)
Not offered 1962–63. Prerequisite: Physics 105. Material fee, $11.

156 *Advanced Laboratory in Optics* (3) Hobbs
Not offered 1962–63. Prerequisite: Physics 106. Material fee, $11.

181 *Biophysics* (3) Yeandle
Spring—evening. Molecular basis of biophysics, biosynthesis, and reproduction. Molecular and genetic aspects of the effects of radiation. Physiochemical equilibria, steady states, and transients in biological systems; order, disorder, and information theory. Admission by permission of the instructor.

191 *Nuclear Reactors* (3) Landon
Fall—evening. Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16, Mathematics 31 or 24.

Third Group

201 *Classical Physical Theory* (3) Jehle
Fall—evening. Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171. (Mathematics 171 may be taken concurrently.)

202 *Classical Physical Theory* (3) Jehle

Spring—evening. Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171.

203–4 *Principles of Modern Physics* (3–3)

Academic year—evening. A critical survey of fundamental topics of modern physics including the theory of relativity, thermal radiation and quantum theory, atomic structure and spectra, wave mechanics, interactions present in multielectron atoms, X rays, the nucleus, properties of matter in bulk.

218 *Solid State Physics* (3) Hobbs

Spring—evening. Tensor properties of crystals. Application of quantum mechanics to problems in solid state physics.

219–20 *Quantum Mechanics* (3–3) Jehle

Academic year—evening. Criticism of classical ideas of mechanics and a formulation of quantum mechanical equations; matrix mechanics and its relation to quantum mechanics; application to various problems of atomic, molecular, and nuclear physics. Prerequisite: Physics 113, 201, 202.

221 *Quantum Electrodynamics and Field Theories* (3) Jehle

1962–63 and alternate years: fall—evening. Variation principles. Relativistic wave equations, quantization of fields, interaction between fields. Scattering theory. S matrix and causality. Prerequisite: Physics 219–20.

222 *Elementary Particles* (3) Jehle

1962–63 and alternate years: spring—evening. Scalar, vector, spinor fields, and elementary particles. Symmetry properties and associated conservation laws. Space inversion and parity, time reflection, charge conjugation. Prerequisite: Physics 219–20

227 *Irreversible Processes* (3) Yeandle

Spring—evening. Extension of thermodynamic concepts to irreversible processes. Discussion of thermodynamic forces and fluxes, and the Onsager reciprocal relations. Review of the statistical mechanical reasons for assuming the postulate of irreversible thermodynamics. Prerequisite: Physics 102, 114; Mathematics 132 or 112.

255–56 *Graduate Laboratory* (4–4) The Staff

First half: fall—day. *Second half:* not offered 1962–63. Individual work on special topics. One semester of this course is required of all Master's candidates in physics. Students electing this course may begin with Physics 255 or 256. Not open to undergraduates. Material fee, $11 a semester.

291–92 *Seminar: Recent Developments in Physics* (1–1) The Staff

Academic year: alternate weeks—Monday evening. Individual investigations of special problems. All students registered for a Master's degree in physics are expected to attend this seminar during residence for the degree, and to take part in its programs. Credit for participation in the seminar work is obtained by registering for this course during the last two semesters of residence: this credit, however, is based upon the seminar work during the entire period of residence.

299–300 *Thesis* (3–3) The Staff

Academic year—as arranged. Fees to be arranged.

PHYSIOLOGY*

Professors C. E. Leese, E. M. Renkin *(Chairman)*
Associate Professor F. P. J. Diecke
Assistant Professors Ruth Henderson, C. S. Tidball *(Research)*, Margret Westecker
Lecturers Eugene Braunwald, J. F. Hoffman, D. P. Rall, R. J. Podolsky
Associates Saul Winegrad, K. A. Hubel, P. G. Nelson, J. H. Mitchell, W. B. Wood, S. E. Downing, E. H. Sonnenblick, W. A. Hagins

* The Staff of Instruction here listed is for the academic year 1961-62.

Special Lecturers S. J. Sarnoff, J. H. U. Brown

Master of Arts or *Master of Science in the field of Physiology.*—Prerequisite: A Bachelor of Arts or Bachelor of Science degree, the program of which includes the following courses or their equivalent: Biology 1-2* or former Zoology 1-2; Chemistry 11-12, 151-52; Physics 11, 12; and Mathematics 12, 29 and 30 or 21 and 22. Chemistry 111-12 and 113-14 or the equivalent are also recommended, but, if lacking, may be taken in the first year of graduate study.

Required: the general requirements, pages 64–66. In addition to the thesis, the thirty hours of required work must include Biochemistry 221-22; Physiology 221-22, 232; and one of the following: Physiology 259, 265, or 281; and at least three semester hours of research (Physiology 295 or 296).

Doctor of Philosophy.—See pages 67–73. The specific prerequisite for admission is the same as for the Master's program.

115 *Introduction to Human Physiology* (3) **Leese**

1962–63 and alternate years: fall—Tues. and Thurs., 8:45 to 10:00 A.M.; 1963–64 and alternate years: fall—Tues. and Thurs., 5:10–6:25 P.M. Lectures on the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of biological science.

130 *Psycho-Physiology* (2) **Leese**

Spring—Tues. and Thurs., 5:10 P.M. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.

137 *Vertebrate Physiology* (4) **Tidball and Staff**

Fall—lecture, Mon., Wed., Fri., 11:10 to 12:00 A.M.; laboratory, Fri., 1:10 to 5:00 P.M. Fundamental principles of physiology as exemplified in the vertebrates. Prerequisite: Chemistry 11-12; Mathematics 3; and Physics 11, 12; or the equivalent. Laboratory fee, $18.

150 *Medical Physiology* **Renkin and Staff**

Spring—lecture 7 hours a week, laboratory 9 hours a week. Lecture and laboratory work in all divisions of physiology. This course is designed for medical students.

170 *General Physiology* (3) **Westecker**

Spring—Tues. 11:10 to 12:00 A.M., Thurs. 10:10 to 12:00 A.M. Lectures on basic topics in the physiology of cells and tissues. Prerequisite: Physiology 137 or 150, or Botany 135; and the consent of the instructor.

211–12 *Problems in Physiology* (arr.) **Renkin and Staff**

Academic year—as arranged. Directed study under the supervision of a staff member. Prerequisite: Physiology 137, 150, or 232, and the consent of the instructor.

221–22 *Physiology Seminar* (1–1) **Henderson and Staff**

Academic year—as arranged. Prerequisite: Physiology 137, 150, or 232, and a reading knowledge of French or German.

232 *Advanced Mammalian Physiology* (10) **Diecke and Staff**

Lecture 7 hours a week, laboratory 9 hours a week. Spring—Mon., Wed., Fri., 1:00 to 5:00 P.M.; Tues. and Thurs., 1:00 to 3:00 P.M. Prerequisite: Chemistry 11-12; Mathematics 3; Physics 11, 12; or the equivalent. It is recommended that Biochemistry 221-22 be taken as a prerequisite or concurrently.

259 *Comparative Physiology* (2) **Diecke**

1964–65 and every third year: fall—as arranged. Lectures and seminars on topics of current interest in comparative physiology, with emphasis on nonmammalian forms. Prerequisite: Physiology 137, 150, 170, or 232, or Zoology 162; and the consent of the instructor.

*This is an interdepartmental course offered by the departments of Botany and Zoology. The student may register in either department.

265 *Physiology of Cell Membranes* (2) Renkin
1962–63 and every third year: fall—as arranged. Lectures and seminars on ionic and molecular transport through biological membranes. Prerequisite: Chemistry 111-12 or Physics 181; *and* Physiology 150, 170, or 232, or Botany 135–36; and the consent of the instructor.

281 *Biophysics* (2) The Staff
1963–64 and every third year: fall—as arranged. Lectures and seminars on biological topics which require development along physical lines. Prerequisite: Chemistry 111–12 or Physics 181 and the consent of the instructor.

295–96 *Research* (arr.) The Staff
Academic year—as arranged. Prerequisite: Physiology 137 and 170; 150 or 232; or the equivalent.

299–300 *Thesis* (3–3) The Staff

POLITICAL SCIENCE*

Professors W. R. West *(Emeritus)*, J. W. Brewer *(Chairman)*, W. H. Kraus
Professorial Lecturer F. M. Riddick
Associate Professors H. L. LeBlanc, Benjamin Nimer, H. R. Ludden, C. R. Crowe
Associate Professorial Lecturers William Spencer, R. C. Bain, H. M. Bain
Lecturer C. H. Slayman, Jr.

Bachelor of Arts with a major in Political Science (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including Political Science 9-10.

Required: in addition to the general requirements, pages 58-62, thirty semester hours from the following groups distributed as follows: twelve hours from Group A; six hours from group B; six hours from Group C; and six additional hours from any group or groups. The student will normally complete all six hours of any full-year course which he selects.

Group A: Political Science 111, 112, 117–18, 121–22. Group B: Political Science 171, 172, 181–82. Group C: Political Science 104, 125, 145, 146, 151–52. Group D: 105, 107, 113, 120, 141, 157–58, 177–78, 187–88, 191–92, 194.

Undergraduate students interested in preparing for graduate work in Public Administration will consult the Chairman of the Department of Political Science for modifications of the above requirements.

Bachelor of Arts with a major in Latin American Civilization (Field-of-Study).—See the Department of History.

Master of Arts in the field of Political Science.—Prerequisite: a Bachelor of Arts degree with a major in Political Science at this University (or the equivalent major elsewhere) with a *B* average (or better) in the major.

Required: the general requirements, pages 64–66. The thirty hours of required work must be approved in advance by the Adviser.

Master of Arts in the field of Latin American Civilization.—See the Department of History.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Arts and *Master of Arts in Government in the fields of International Affairs* and *Public Affairs.*—See pages 131–33, 135–38.

First Group

1 *Introduction to Government*† (3) The Staff
Fall—day; spring—evening; summer 1962. Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

* The Staff of Instruction here listed is for the academic year 1961–62.
† Six hours of first-group Political Science courses are prerequisite to all second-group courses.

9–10 *Government of the United States** (3–3) **The Staff**
First half: fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening. *First half:* structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.

SECOND GROUP*

104 *State and Local Governments* (3) **LeBlanc**
Spring—day. State, municipal, and other local governmental forms, operations, and problems, with attention to policy formulation and administration, and to the forces of practical politics.

105 *The Governmental Process of the District of Columbia* (3) **LeBlanc**
Not offered 1962–63. Legal structure and political problems of the District of Columbia including restrictions on home rule, Congressional relations, and group politics.

107 *Problems in Modern Political Thought* (3) **Kraus**
Summer 1962. Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.

111 *Introduction to Comparative Government and Politics* (3) **Kraus**
Fall—day; summer 1962. Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.

112 *Introduction to Comparative Government and Politics* (3) **Kraus**
Spring—day. Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.

113 *Political Problems of the British Commonwealth of Nations* (3) **Kraus**
Not offered 1962–63. From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states in Asia and Africa.

117–18 *Political Theory: the Nature and Growth of Political Thought in the West* (3–3) **Kraus**
Academic year—evening. *First half:* from Classical Antiquity to the Middle Ages; the forging of the western political tradition. *Second half:* from the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, and resistance; liberalism, democracy, and conservatism.

120 *Foundations of American Democracy* (3) **Brewer**
1962–63 and alternate years: spring—day. Introduction to political thought in the United States from colonial times to the end of the Civil War period.

121–22 *The Constitution of the United States* (3–3) **West**
Academic year—evening. Judicial power of federal courts in constitutional interpretation. *First half:* emphasis on separation of powers, federal-state relationships, and taxation. *Second half:* emphasis on constitutional protection of civil rights.

125 *Legislative Organization* (3) **Riddick**
1963–64 and alternate years. A study of Congress: constitutional aspects, legal analysis of make-up, and political organization. Political and parliamentary procedures used in the preparation and enactment of legislation. Not open to students who have credit for former Political Science 124.

141 *The Development of Legal Institutions* (3) **Brewer**
1963–64 and alternate years. Introduction to historical jurisprudence: primary attention to the origins of the Roman Law of Continental Europe and of the Anglo-Saxon Common Law.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

145 *Political Parties and Politics* (3) LeBlanc
Fall—evening; summer 1962. Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress.

146 *Political Pressures and Public Reactions* (3) Ludden
Spring—evening. Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.

151–52 *Public Administration* (3–3) LeBlanc
First half: fall—day; summer 1962. *Second half:* not offered 1962–63. Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.

157–58 *Current Problems in Domestic Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary issues in internal American politics with discussion of problems and policies.

166 *Field Work in Government* (3) LeBlanc
Fall—as arranged; spring—as arranged. Practical training in the operation of the Federal Government, based on experience through assignment to selected government offices. Students will have an opportunity to observe and participate in government in the Washington area. Open only to students in the Public Affairs curriculum, School of Government, Business, and International Affairs.

171 *International Politics* (3) Ludden, Nimer
Fall—day and evening; summer 1962. Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.

172 *International Organization: the United Nations* (3) Ludden
Spring—day and evening; summer 1962. Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations.

177 *Recent Trends in Latin American Politics and Government* (3) Davis
Fall—day. Types of government, recent developments, and current political conditions in each of the twenty Latin American republics.

178 *International Politics in the Western Hemisphere* (3) Davis
Spring—day. Political relations of the American Republics in the 19th and 20th centuries, the development of Pan Americanism and the Organization of American States.

181–82 *International Law* (3–3) Brewer
Academic year—day and evening; summer 1962—Political Science 181 (3). Survey of the public law of nations with emphasis on the law of peace. Neutrality and the so-called law of war receive attention in the second semester.

187–88 *Current Problems in International Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary international issues with discussion of problems and policies.

191 *Politics of the Middle East* (3) Nimer
Fall—day. Domestic and international politics of Turkey, Iran, Israel, and the Eastern Arab States and Principalities. Special attention to the specifically regional aspect of the foreign policies of these countries.

192 *Politics of North and Central Africa* (3) Nimer
Spring—day. Domestic and international politics of the Western Arab States, Ethiopia, Somalia, Liberia, and the newly independent states of former British, French, and Belgian Africa. Special attention to the specifically regional aspect of the foreign policies of these countries.

194 ***Far Eastern Politics: Contemporary International Relations in the Pacific Area*** (3)

Spring—evening. Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.

197 ***Proseminar in International Affairs*** (3) Nimer

Fall—evening; spring—day; summer 1962. Reading and discussion course for coordination and review. Primarily for seniors in the International Affairs major.

Third Group

205–6 ***The Federal Executive*** (3–3) R. C. Bain

Academic year—evening. *First half:* nomination and election of the U. S. President, his constitutional and political powers; the cabinet and the Executive Office of the President; the relation of the President to the executive and legislative branches of the government. *Second half:* the practical politics of the presidency, presidential policy leadership and control, the President as party head and as moulder of public opinion.

209–10 ***Seminar: the Federal Government of the United States*** (3–3)

1963–64 and alternate years. Advanced research emphasizing legislative problems of Congress and relations of Congress with the Administration.

212 ***Seminar: Comparative Government and Politics*** (3) Kraus

Spring—evening. Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem. Attention will be directed to questions of method.

213 ***Readings in Comparative Government and Politics*** (3) Kraus

Fall—evening; summer 1962. Readings and group discussions on methodological questions, comparative political and administrative institutions with attention to legislatures, the changing role of the executive, political parties, constitutional and totalitarian approaches to public management and public service, the role of the military, etc.

217 ***Seminar: Topics in Political Theory*** (3) Kraus

Fall—evening. Research and discussion on problems of modern political and constitutional theory, theoretical aspects of representative government, democracy, socialism, and totalitarianism. Each semester is devoted to a separately announced topic, such as socialism and communism, theories of resistance and revolution, problems of democratic theory.

220 ***Reading Course in Political Theory*** (3) Kraus

Spring—evening. Readings and group discussions, principally on modern political and constitutional theory since the 17th and 18th centuries.

221–22 ***Seminar: The Constitution of the United States*** (3–3) West

1962–63 and alternate years: academic year—evening. Selected topics in the development of the law of the Constitution. Primary attention will be given to the development of "due process of law" in the courts.

235 ***Metropolitan Problems*** (3) H. M. Bain

Fall—evening. Growth of American cities and changing land use patterns in relation to internal transportation systems. The respective roles of the private automobile and of public transportation. The problems of financing and administering public transportation systems under public and private ownership.

245–46 ***The American Political Process: Political Parties and Interest Groups*** (3–3) LeBlanc

Academic year—evening. *First half:* readings and group discussions on the nature and functions of political parties and the role and techniques of political interest

groups. *Second half:* seminar on selected topics of American politics requiring the use of basic research materials.

271–72 *Problems in International Politics and Organization* (3–3) Ludden
Academic year—day. A seminar to develop techniques of research in recent international affairs and to examine developments in international politics and organizations.

273 *Public Opinion and Foreign Policy* (3) Ludden
Fall—evening. Development, organization, and operation of international information programs by major world powers. Public opinion in the United States influencing the formation and conduct of foreign policy.

274 *Methods and Objectives of Foreign Policy* (3)
Spring—evening. Examination of the objectives of foreign policies of the major powers, with attention to political, economic, and military methods used to pursue these objectives.

277 *Seminar: Latin American Government* (3) Davis
Fall—evening; summer 1962. Analysis of the political structures of selected Latin American republics. Two comparable governments studied each year.

278 *Seminar: Latin American Political Philosophy* (3) Davis
Spring—evening. Research in political personalities and philosophies of 19th and 20th century Latin America.

279 *Reading Course in International Affairs* (3)
Fall—evening; summer 1962. Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization.

281–82 *Seminar: International Law and Relations* (3–3) Brewer
First half: fall—evening; summer 1962. *Second half:* not offered 1962–63. Research in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications.

292 *International Politics and Government in the Middle East* (3) Nimer
Spring—evening. Research and analysis of the international relations and major political problems of the Arab world and adjacent areas.

293–94 *Seminar: International Politics and Government in the Pacific Area* (3–3)
Academic year—evening. Research and analysis of the major patterns of development in internal and international politics of the area, with advanced study of the governmental institutions of the Far East. The Staff

299–300 *Thesis* (3–3)
Academic year—as arranged; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers political science courses listed below for students in the following special programs: Air Force Advanced Management Program, Army War College Program, National War College Program.

283 *Topics in International Law* (3) Brewer
A consideration of theory, problems, and cases in the public law of nations, including the law of peace and the law of war.

285 *Diplomacy Since World War II* (3) Jordan
Recent changes in diplomatic procedures and objectives as compared with those of earlier periods.

287 *American Military Policy* (3) Stanley
Examination of the nature of military policy and its relation to domestic and foreign policy, the historical element, organization within the military establishment for policy making.

297 *Directed Individual Readings in Political Science* (arr.) The Staff
Bibliography and associated conferences on selected topics for advanced students.

PSYCHIATRY*

Professors Winfred Overholser *(Emeritus)*, Leon Yochelson *(Chairman)*, Samuel Yochelson *(Research)*
Clinical Professors Joel Elkes, J. D. Schultz, D. C. Cameron, F. A. Freyhan, D. M. Bullard
Associate Professor J. E. Rankin
Associate Clinical Professors H. P. Laughlin, M.deC. Ruffin, Sidney Berman, Morris Kleinerman, Anna Todd, Norman Taub
Assistant Clinical Professors Sarah Tenenblatt, Richard Schaengold, Leon Ferber, P. H. Gray, David Eden, C. T. Bever, Joseph Abrahams, Paul Chodoff, R. M. Greenberg, Helen Pallister, M. L. Adland
Associates W. C. Johnson, W. D. Kehne, H. A. Meyersburg, R. A. Rogers, J. A. Farrell, S. C. Gordon, H. B. Lehrman, R. A. Frank, Helen Pearcy, A. M. Drummond, G. W. Sprehn, N. C. Rintz, Leslie Schaffer, J. L. Sheridan, L. J Duhl
Clinical Instructors Maxwell Boverman, G. W. Metcalf, S. L. Werkman, D. W. Harris, A. H. Kiracofe, Jr., T. M. Mackenzie, B. W. Murphy, Daniel Prager, F. N. Waldrop, J. H. Bouma, Jean Menetrez

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Special Lecturers R. H. Felix, Mathew Ross

165 *Introductory Medical Psychology* Berman
Fall—1 hour a week. An orientation course in the anatomical, physiological, and psychological growth and development of personality. Consideration of characteristics of structure, function, and development of the psyche leading to normal behavior as a basis for the study of the pathological. Evaluation of interpersonal relationships.

178 *Psychopathology* Rankin
Spring—1 hour a week. Manifestations and understanding of various mental mechanisms and abnormal reaction-types, preceded by history of development of psychopathology and illustrated with case material.

266 *Psychiatry* Yochelson
Spring—1 hour a week. Psychiatry in the practice of Medicine. Techniques of interviewing.

268 *Demonstration Clinics* The Staff
Spring—3 hours a week. History, etiology, symptoms, course, and treatment of the major psychoses with emphasis on the dynamics involving the person as a whole. Presentation of clinical cases of major mental illnesses and primary behavior disturbances. St. Elizabeths and D. C. General hospitals.

272 *Psychosomatic Aspects of General Medicine* Ruffin
Spring—1 hour a week. Somatic disorders of psychogenic origin. The role of personality reactions in functional and organic disorders.

* The Staff of Instruction here listed is for the academic year 1961–62.

324 *Psychoneurosis* Ferber

Spring—1 hour a week. Etiology, psychopathology, clinical aspects, and treatment of various types of psychoneuroses. Medical Conference Room, D. C. General Hospital

431–32 *Clinical Clerkship* The Staff

Three weeks divided service as arranged during academic year. Supervised examination, diagnosis, and treatment of ambulatory cases in University Hospital and hospitalized cases in St. Elizabeths Hospital. Conferences for discussion of cases. Clinical application of psychiatric principles to general medical practice is stressed. University Hospital Inpatient and Outpatient Psychiatric clinics and St. Elizabeths Hospital

PSYCHOLOGY*

Professors Mitchell Dreese†, Thelma Hunt *(Chairman)*, D. C. Faith
Professorial Lecturers H. F. Hubbard, Margaret Ives, G. H. Mowbray
Associate Professors C. E. Tuthill, W. E. Caldwell, J. N. Mosél, R. D. Walk, Eva Johnson, C. W. Hill, Virginia Kirkbride, L. E. Schlesinger *(Research)*
Associate Professorial Lecturer J. G. Colmen
Assistant Professors R. E. Nolan, Lila Ghent *(Research)*, Jacqueline Goodnow *(Research)*
Lecturer C. J. Lindley
Associate Janet Johnson

Bachelor of Arts with a major in Psychology (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including Psychology 1, and 4 or 22 or 29.

The general requirements for the degree are stated on pages 58–62. The sixty required semester hours must include twenty-seven hours in Psychology in addition to those taken as prerequisites, including Psychology 98, 118, 131, 151, 191, and 196; and Statistics 53 or 104.

Master of Arts or *Master of Science in the field of Psychology.*—Prerequisite: the degree of Bachelor of Arts with a major in Psychology at this University, or the equivalent. Required: the general requirements, pages 64–66. Of the twenty-four required semester hours (exclusive of the thesis), a minimum of eighteen must be in third-group courses; a minimum of twelve must be in psychology including Psychology 201 and 202; twelve may be in related fields approved by the Department.

Master's programs are available in the following fields of concentration: (1) tests and measurements, (2) counseling and guidance, (3) clinical-abnormal, (4) social, (5) personnel, (6) experimental, (7) personality, and (8) experimental comparative. For detailed requirements consult the Chairman of the Department.

Doctor of Philosophy.—See pages 67–73.

Master of Arts in Government or *Master of Business Administration in the field of Personnel Administration including options in Counseling and Psychometrics.*—See pages 135–37, 141–42.

Master of Arts in Education in the fields of Employee Training and of Guidance.—Prerequisite: a Bachelor's degree from an accredited institution and two years of successful teaching experience. See pages 123–25.

First Group

1 *General Psychology*‡ (3) The Staff

Fall—day and evening; spring—day and evening; summer 1962. The fundamental principles underlying human behavior.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence 1961–62.
‡ Psychology 1 is prerequisite to all other courses in Psychology.

4 *Psychology of Adjustment* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.

22 *Introduction to Educational Psychology* (3) — Dreese, Faith
Fall—evening; spring—day. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3) — Johnson
Fall—day; spring—evening; summer 1962. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

98 *Abnormal Psychology* (3) — Nolan, Hunt
Fall—day and evening; spring—day; summer 1962. The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.

Second Group*

112 *Adolescent Psychology* (3) — Johnson
Fall—day. Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.

115 *Psychology and Language and Communication* (3) — Mosél
Fall—day. An introduction to psycho-linguistics and verbal behavior. Information theory, the measurement of meaning, cultural and linguistic structures in the perception and learning of language.

118 *Physiological Psychology* (3) — Hill
Fall—evening; spring—day; summer 1962. Structure, function, and phylogeny of receptors, nervous system, and effectors as mediators of behavior, including drives, learning, and emotions.

121 *Educational Psychology* (3)
Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.

129 *Introduction to Counseling and Guidance* (3) — Dreese
Fall—evening; summer 1962. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.

131 *Psychological Tests* (3) — Hunt
Fall—evening; spring—day; summer 1962. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7.

141 *Leadership, Group Behavior, and Student Life* (3) — Faith
Fall—day. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.

144 *Personnel Psychology* (3) — Hubbard, Mosél
Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.

146 *Interpersonal Relations* (3) — Schlesinger
Fall—day. The psychosocial processes involved in social interaction. The perception of other persons, social communication, small group processes, group problem-solving and change.

* Six credits in first-group courses are prerequisite to all second-group courses.

148 *Psychology of Advertising and Consumer Behavior* (3) Mosel
1963-64 and alternate years. The motivational and social processes in economic behavior. Consideration of current techniques and findings in motivational research. Evaluation of the effectiveness of mass media, public relations programs, and strategies of persuasion.

151 *Social Psychology* (3) Tuthill
Fall—evening; spring—day; summer 1962. The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.

156 *Psychology of Propaganda and Public Opinion* (3) Tuthill
Spring—evening; summer 1962. The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

161 *Comparative Psychology* (3) Caldwell
Spring—day. A lecture course in animal psychology. Covers psychological processes in infrahuman organisms, evolution of behavior, the place of animal experimentation and research in psychology.

162 *Experimental Comparative Psychology* (3) Caldwell
Fall—as arranged; spring—as arranged. Opportunity for individual psychological experimentation using lower animals as subjects. Offered on independent study plan. Prerequisite: Psychology 161 and permission of the instructor.

191 *Experimental Psychology* (3) Hill, Walk
Fall—day and evening; spring—day and evening. The application of experimental methods to various psychological problems. Prerequisite: 6 credits in psychology and an elementary course in statistics. Material fee, $10.

192 *Problems in Experimental Psychology* (3) Hill, Walk
Fall—as arranged; spring—as arranged. Opportunity for work on individual experimental projects. Prerequisite: Psychology 191 and permission of the instructor.

193–94 *Readings in Psychology* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 193 (3). Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality-point index of 3.00 or higher. Admission by special permission of the instructor.

196 *History and Systems of Psychology* (3) Caldwell
Fall—day; spring—evening; summer 1962. A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology.

THIRD GROUP*

201 *Seminar: Advanced General Psychology* (3) Hill
Fall—day; spring—evening. General review of the field for graduate students with an intensive study of selected problems. Required in all graduate programs.

202 *Psychological Research Methods and Procedures* (3) Walk
Fall—evening; spring—day; summer 1962. Required in all graduate programs. Prerequisites: Experimental Psychology and an elementary course in statistics.

207–8 *Readings in Psychology for Graduate Students* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 207 (3). Supervised readings with conferences on specified topics in psychology. Open only to students who have had course work in the field of the readings.

* Open only to graduate students, except by special permission of Instructor and Chairman of the Department.

209 *Seminar: Psychology of Motivation* (3) Caldwell
Fall—evening. A consideration of various theoretical approaches to the psychology of motivation and systematic concepts and experimental findings deriving from each approach.

212 *Personality Evaluation by Projective Techniques* (3) Nolan, Ives
Fall—day; spring—evening. Primary emphasis upon administration and scoring of the Rorschach Test. Prerequisite: Psychology 233.

213 *Clinical Psychometrics* (3) Ives
Spring—evening. A study of the clinical applications of nonprojective tests. Prerequisite: Psychology 233.

215 *Advanced Study of Projective Techniques* (3) Nolan, Ives
Fall—evening; spring—day. Primary emphasis upon interpretation of the Rorschach Test. Prerequisite: Psychology 212.

217 *Seminar: Developmental Psychology* (3) Ghent
Spring—day.

218 *Seminar: Clinical Psychology—Psychopathology* (3) Nolan
Fall—evening; summer 1962. Covers basic etiological factors in behavioral and psychological deviations and disorders.

219 *Seminar: Clinical Psychology—Psychotherapy* (3) Nolan
Spring—day. Covers theoretical principles underlying psychotherapy, techniques and procedures, and problems of evaluation.

220 *Seminar: Abnormal Psychology* (3) Hunt
Fall—day; spring—evening. An intensive study of selected problems in the field of abnormal psychology.

223 *Seminar: Learning* (3) Walk
Fall—day. Covers research and theory in the psychology of learning.

225 *Seminar: Mental Hygiene* (3) Lindley
Fall—evening; spring—day. A study of mental health problems with special attention to needs of counselors.

226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3) Johnson
Spring—evening. A survey of behavior and personality disorders.

227 *Seminar: Counseling and Guidance* (3) Dreese
Spring—evening. Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.

228 *Seminar: Techniques of Counseling* (3) Dreese
Fall—evening; spring—evening; summer 1962. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Psychology 229 and 236. In exceptional cases Psychology 229 or 236 may be taken concurrently with 228.

229 *Seminar: Occupational and Educational Information* (3) ————, Faith
Fall—evening; spring—evening. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.

231 *Test Construction* (3) Mosél
Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and

vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

233 *Individual Psychological Testing* (3) Johnson
Fall—day; spring—day. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, $7.

234 *Seminar: Test Theory* (3) Mosél
1962–63 and alternate years: fall—evening. Development of the axiomatic-deductive theory underlying the major notions in the construction, evaluation, and application of psychological tests.

235 *Seminar: Psychological Measurement* (3) Hunt
Spring—evening. Advanced instruction in the use and interpretation of psychological tests, with emphasis upon group tests; survey of recent research in psychological measurement. Prerequisite: a course in psychological or educational measurement.

236 *Seminar: Analysis of the Individual for Purposes of Counseling* (3) Faith, ———
Fall—evening; spring—evening; summer 1962. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

244 *Seminar: Job Analysis and Evaluation* (3) Mosél
Summer 1962.

245 *Seminar: Employee Motivation and Morale* (3) Mosél
Spring—evening. An analysis of organizational behavior, especially with regard to motivation and productivity. The implications of recent research on employee attitudes, the primary group, the effects of various patterns of supervisory leadership, the role of formal and informal organization, and job design.

246 *Seminar: Personnel Measurement Techniques* (3) Mosél
Fall—evening. Detailed consideration of the techniques of personnel selection and performance evaluation. The use of employment tests, personal data, assessment interviews, and performance ratings.

249 *Seminar: Human Engineering* (3) Mowbray
Fall—evening. Application of findings and methods of experimental psychology to design and operation of equipment and man-machine systems. Relation of capacities of the operator to information display systems, control mechanisms, work environment, and work methods.

251 *Seminar: Advanced Social Psychology* (3) Tuthill
Fall—evening. Current research and theory in social psychology; group dynamics, ego-involvements, action research, and social interaction theory.

254 *Seminar: Group Dynamics* (3) Tuthill
1963–64 and alternate years. The experimental study of small groups; autocratic and democratic group climates; interaction process analysis; Lewin's field theoretical approach to individual and group processes.

255 *Seminar: Techniques of Opinion and Attitude Measurements* (3) Tuthill
1962–63 and alternate years: spring—evening. Methods of attitude measurement (interviews, questionnaires, scales, polls) as currently used by private and government investigators. The place of attitude studies in schools, industry, government, etc.

258 *Applied Social Psychology* (3) Mosél
Spring—evening. The development of personality, personality adjustment, nature of communication and interaction; structure and functioning of groups, group dynamics, opinion and attitude formation, and opinion and attitude measurement. Classroom activity supplemented by practical observations and projects. Open only to graduate students in hospital administration, engineering administration, and other graduate administrative programs.

261 *Seminar: International Communication* (3) Mosél
1963–64 and alternate years. The communication process, problems in mass communication, measuring and modifying opinions and attitudes, principles of persuasion, psychological warfare.

262 *Dynamics of Social Change* (3) Lippitt
Spring—evening. Current research and theory related to the process of social change. Basic principles of planned change will be explored in connection with individual, group, organization, community, and cultural change. Human factors in the change process will be emphasized.

264 *Sensitivity Training: Human Relations Laboratory Course* (3) Lippitt
Fall—evening; spring—evening. A sensitivity learning experience in human relations. The course is built around an unstructured group experience with opportunities for individual feedback, experimentation, and practice. The goal of the course is the development of self-insight, situational sensitivity, and diagnostic skills in human relations. Prerequisite: 9 semester hours in psychology or sociology.

265 *Theory and Design in Human Relations Training* (3) Lippitt
Fall—day. Designed for those interested or involved in conducting human relations training. Theories of learning are reviewed. The laboratory approach to human relations training is explored in depth. Practice in designing, developing training skills, and evaluation of training are covered. Prerequisite: Psychology 264 or a human relations laboratory learning experience.

267 *Theories of Organization* (3) Schlesinger
Spring—day. Theory and research in formal organizations. Classical, human relations, and information processing theories of organizations. The effects of organizational design on communication processes, leadership, decision-making, intertroup relations, small group formation, status hierarchies, productivity, motivation, and morale. Open to graduate students in psychology and graduate administrative programs.

272 *Seminar: Theories of Personality* (3) Caldwell
Fall—evening. A survey of the various theories of personality, with emphasis upon theoretical problems and methodology in the field of personality study.

281–82 *Practicum in Counseling* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 281 (3). Supervised practical instruction in agencies doing counseling. Prerequisite: graduate work in counseling. Admission by permission of the Chairman of the Department.

283–84 *Practicum in Clinical Psychology* (3–3) Nolan
Academic year—as arranged; summer 1962—Psychology 283 (3). Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psychology 212 and 233. Admission by permission of the Chairman of the Department.

289–90 *Seminar: Current Research and Theory in Psychology* (3–3) ———
Academic year—evening; summer 1962—Psychology 289 (3). A review and discussion of contemporary research and theory in some advanced and specialized field of psychological study, by leaders in the field. The specific topic and instructor for each semester will be announced in advance of the beginning of the semester.

292 *Seminar: Perception* (3) Walk
Spring—evening. Study of current research and theory in the experimental psychology of perception.

295–96 *Research in Psychology* (arr.) The Staff
Academic year—as arranged; summer 1962. Individual research by student, carried out under supervision of staff member.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

Course Offered in Special Program

In addition to the regular courses announced above the University offers the following course, which is available only to students enrolled in the Engineering Administration program.

145 *Principles of Human Relations* (3) Schlesinger
Fall—evening; spring—evening; summer 1962.

RADIOLOGY*

Professor W. W. Stanbro *(Chairman)*
Assistant Professor W. W. Saunders
Assistant Clinical Professors Charlotte Donlan, S. R. Bersack, H. J. Kicherer, H. L. Berman, E. R. King, J. T. Brennan, Albert Bauer, Henry Harrell
Associates A. C. Wyman, S. W. Smith
Instructor C. F. Murphy
Clinical Instructors George Tievsky, U. V. Wilcox II, C. M. Weber, Nan Van Wagenen, Zeki Erim

115–16 *Anatomy* The Staff
Academic year—as arranged. Correlation of gross and Roentgen anatomy.

220 *Principles of Radiology* The Staff
Spring—1 hour a week. Lectures and discussions.

313 *Advanced Radiological Diagnosis* The Staff
Fall—as arranged. Lectures and discussions.

421–22 *Clinical Studies* The Staff
Students are assigned to the X-ray Department in rotation on a full-time basis for a specific period.

RELIGION*

Professors J. R. Sizoo, C. E. Olmstead *(Chairman)*
Professorial Lecturers T. A. Stone, R. E. McNally
Associate Professor R. G. Jones
Associate Professorial Lecturer C. D. Kean
Lecturers A. B. Seidman, E. W. Seaman

Bachelor of Arts with a major in Religion (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including Religion 9, 10, and 59–60. Required: the general requirements, pages 58–62, including a minimum of eighteen semester hours in religion beyond first-group courses.

Master of Arts in the field of Religion.—Prerequisite: an undergraduate major in Religion at this University or the equivalent.

Required: the general requirements, pages 64–66. Of the twenty-four semester hours of required courses (exclusive of the thesis), at least twelve must be in third-group religion courses; a maximum of nine may be in a closely related field outside the Department of Religion as approved by the Department.

* The Staff of Instruction here listed is for the academic year 1961–62.

Master of Arts in the field of Religious Education.—Prerequisite: an undergraduate major in Religion at this University or the equivalent; the following specific courses or the equivalent: Education 108; Psychology 1, 22, and 29; Sociology and Anthropology 1; Speech 1 or 11.

Required: the general requirements, pages 64–66. Of the twenty-four semester hours of required courses (exclusive of the thesis), at least six must be in third-group religion courses; a maximum of twelve may be in a closely related field outside the Department of Religion as approved by the Department.

Doctor of Philosophy in the field of the History of Religion in the United States.—See pages 67–73.

First Group

9 *The Old Testament* (3) Jones and Staff

Fall—day and evening; summer 1962. A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities.

10 *The New Testament* (3) Jones and Staff

Spring—day and evening; summer 1962. A study of the literature of the New Testament from the standpoint of occasion, purpose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles.

59–60 *History of Religion* (3–3) Olmstead and Staff

First half: fall—day and evening. *Second half:* spring—day and evening; summer 1962. *First half:* primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. *Second half:* Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status.

Second Group

103 *The Prophets, Their Times and Their Message* (3) Jones

Fall—day. The development of prophetism in the Old Testament; cultural, economic, psychological, and religious factors in the movement; elements of lasting value in the prophetic teaching. A few of the prophets will be selected for particular study.

104 *The Life and Thought of Jesus* (3) Kean

Spring—day. A comprehensive study of the life and teachings of Jesus as they relate to problems of belief, standards of value, and patterns of life; the significance of the message of Jesus for our own times.

105 *The Life and Thought of Paul* (3) Kean

Fall—evening. Greek and Hebrew backgrounds of early Christianity, the Roman world of the first century, religious and social conditions affecting the spread of Christianity, the life and journeys of Paul, Paul's teaching and presentation of the Christian faith, the place of the Pauline epistles in the New Testament.

121 *Problems of Western Religious Thought* (3) Olmstead

Fall—day. The nature of religious truth and experience; the existence, character, and activity of God; the predicament of modern man; the problem of evil and suffering; eternal life; science and religion; the meaning of worship; religious views of history.

122 *Christian Ethics and Modern Society* (3) Jones

Spring—day. The nature and principles of the Christian life as developed by the Christian community; problems of personal conduct; the application of the Christian standard to family, social, and economic institutions.

131 *History of Christianity to the Reformation* (3) Olmstead, McNally

Fall—day. The rise and expansion of Christianity, the development of Christian thought, the evolution of church organization and worship, the Renaissance and pre-Reformation dissent.

132 *History of Modern Christianity* (3) Olmstead, McNally
Spring—day. The origin and development of Protestantism; the Roman Catholic revival; the status of the Eastern churches; doctrines, worship, expansion, church and state, and relation to modern thought and life.

135 *History of Judaism to the Talmud* (3) Seaman
Fall—day. A study of the history and religious thought of the Jewish people from the Maccabean revolt to the compilation of the Talmud.

136 *History of Medieval and Modern Judaism* (3) Seaman
Spring—day. A study of the history and religious thought of the Jewish people from the compilation of the Talmud to the present.

141–42 *Religious Education* (3–3) Stone
Not offered 1962–63. Principles and practices of religious education in the home, church, and community; basic educational procedures and special techniques; organization and administration of religious education.

172 *Religion in American Culture* (3) Olmstead
Spring—evening; summer 1962. Growth of religious bodies and institutions in American culture, the heritage of religious freedom and diversity, religion and literature, revivalism and education, science and religious thought, divisions and cooperative movements in religion.

THIRD GROUP

209–10 *Seminar in Biblical Literature* (3–3) Jones
Academic year—evening. Study of the main problems of Biblical literary and historical criticism.

211–12 *Seminar in Biblical Thought* (3–3) Jones
Not offered 1962–63. Study of the Biblical interpretation of history and reality and its relation to Biblical beliefs about God, man, and the world.

231–32 *Seminar in Early and Medieval Christianity* (3–3) Olmstead, Jones
Academic year—evening. An advanced study of the development of Christian thought from primitive beginnings to the Reformation.

234 *Seminar in Modern Religious Thought* (3) Olmstead
Not offered 1962–63. Analysis of developments in western religious thought from the 18th century to the present.

241–42 *Seminar in Religious Education* (3–3)
Not offered 1962–63. Advanced course dealing with some of the major problems in the practice of religious education.

271 *Seminar in American Religious History to 1830* (3) Olmstead
Not offered 1962–63. Study of religious thought and life during the colonial and early national period.

273 *Seminar in American Religious History since 1830* (3) Olmstead
Fall—as arranged. Analysis of modern and contemporary trends in American religious thought.

291–92 *Readings and Research* (3–3) The Staff
Academic year—as arranged; summer 1962. Investigation of special problems in the history of religion. The Staff

299–300 *Thesis* (3–3)
Academic year—as arranged; summer 1962.

Related Courses in Other Departments

Art 115, *Christian Iconography* (3)
Classical Languages and Literatures 11–12, *First-year Greek* (3–3)
Classical Languages and Literatures 13–14, *Second-year Greek* (3–3)
Classical Languages and Literatures 21–22, *First-year Classical Hebrew* (3–3)
Classical Languages and Literatures 23–24, *Second-year Classical Hebrew* (3–3)

ROMANCE LANGUAGES AND LITERATURES*

Professors A. T. Deibert *(Emeritus)*, G. E. McSpadden, L. A. Vignéras
Associate Professors Rafael Supervía, J. W. Robb, W. G. Clubb *(Chairman)*, C. Y. Meade, G. E. Mazzeo
Assistant Professors J. L. Metivier, Jr., Carlos Lozano, J. A. Frey
Instructors Elizabeth Neyman, Gérard Huvé, Eulogia Llansa
Language Workshops Supervisor R. T. Tyser

Courses are generally conducted in the language concerned. For General Courses in Romance Languages and Literatures (French, Italian, Portuguese, Spanish) see pages 301–2.

Bachelor of Arts with majors in (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature (Field-of-Study).*—Prerequisite: the Arts and Letters curriculum, pages 52–53.

Required: the general requirements, pages 58–62 and the grade "pass" on the major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes the political, social, and cultural backgrounds of the literature studied; the writers and their works. Proficiency in the spoken and written language is required. Majors in Romance Languages are strongly advised to study Latin, a knowledge of which is generally required for graduate work. The Department provides a proseminar in each of the major fields intended to assist the student in his preparation for the major examination.

Master of Arts in the fields of (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature.*—Prerequisite: the degree of Bachelor of Arts in the appropriate field from this University, or the equivalent.

Required: the general requirements, pages 64–66. The thirty hours of required work must include a thesis, for which six hours of credit are allotted. The remainder of the program is arranged in consultation with the student's major adviser.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Arts in Education with teaching fields in French and in Spanish.—Prerequisite: the Education curriculum, pages 54–55.

Required: the French option or the Spanish option and the professional courses listed in the School of Education Catalogue.

FRENCH

First Group

1-2 *First-year French* (3–3) The Staff

A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose.

* The Staff of Instruction here listed is for the academic year 1961–62.

Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

3–4 *Second-year French** (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: French 1–2 or two years of high school French.

9–10 *French Conversation and Composition* (3–3) The Staff
Academic year—day and evening; summer 1962. Prerequisite: French 4 or the equivalent and permission of the instructor.

49 *French Readings for Nonmajor Students* (3) Frey and Staff
Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51–52 *Survey of French Literature and Civilization** (3–3) Metivier
Academic year—day and evening. The social, artistic, and cultural background of French civilization. Lectures, readings, recitations, and informal discussions.

SECOND GROUP*

109–10 *Advanced French Conversation and Composition* (3–3) Meade
Academic year—day. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: French 10 or the equivalent and permission of the instructor.

119–20 *French Literature of the Sixteenth Century* (3–3) Metivier
1963–64 and alternate years. Prose, poetry, drama, and memoirs of the French Renaissance; Rabelais, Montaigne, Marot, La Pléiade, etc. Class analysis of texts, collateral reading.

121–22 *French Literature of the Seventeenth Century* (3–3) Clubb
1962–63 and alternate years: academic year—day. History, philosophy, criticism, memoirs, letters, eloquence, drama, fiction, poetry. Class analysis of texts; collateral reading.

123–24 *French Literature of the Eighteenth Century* (3–3) Meade
1963–64 and alternate years. History, philosophy, criticism, letters, drama, fiction, poetry, the "salons", the idea of progress, the idea of science. Class analysis of texts, collateral reading, lectures on literature and history.

125–26 *French Literature of the Nineteenth Century* (3–3) Frey
1962–63 and alternate years: academic year—evening. Romanticism and realism: fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

127–28 *French Literature of the Twentieth Century* (3–3) Clubb
1963–64 and alternate years. Fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

129–30 *Contemporary French Literature* (3–3) Clubb, Meade
Summer 1962—French 129 (3). Existentialism and surrealism in the novel, poetry, and drama from 1938 to the present. Lectures, discussions, and reports.

199–200 *Proseminar: Readings for the Major in French Literature* (3–3) Frey
Academic year—as arranged. Conferences and group discussions.

* French 3–4 is required, and French 51–52 is recommended, as prerequisite to all second-group courses.

THIRD GROUP

201 *Doctoral Seminar* (3) Clubb
Fall—day. Introduction to the doctoral program. Methods of research and presentation in the Romance languages and literatures.

202 *History and Methods of Literary Analysis and Criticism* (3) Meade
Spring—day. Literary criticism from Aristotle to the New Critics. Methods to be demonstrated and applied to selected passages from French literature. Emphasis on technique known as *explication de texte.*

203 *Problems of Pronunciation and Intonation* (3) Vignéras
Fall—day.

212 *Historical French Grammar* (3) Vignéras
Spring—day. Study of phonology, morphology, and syntax of Old French, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in French literature, Romance 279 *Introduction to Romance Philology and Linguistics* (see General Romance Courses), and an elementary knowledge of Latin.

213–14 *Old French* (3–3) Vignéras
Academic year—day. Survey of French literature to the end of the Middle Ages. Prerequisite: a second-group course in French literature and the permission of the instructor.

224 *Seminar: The Age of Rabelais* (3)
1963–64 and alternate years—fall. Humanism and the Reformation in French letters. Rabelais and the *conteurs.* Research projects, papers, reports.

225 *Seminar: The Age of Montaigne* (3)
1964–65 and alternate years—spring. Montaigne: the man and the development of his thought. The literature of the Religious Wars. Research projects, papers, reports.

226 *Seminar: French Poetry from Villon to Malherbe* (3) Frey
1962–63 and alternate years: fall—day. Theories and the practice of the art of poetry in the French Renaissance. The cultivation of a poetic language and the development of genres. Papers, reports.

227 *Seminar: The Renaissance in Europe* (3) Clubb
1964–65 and alternate years—fall. The sources and nature of literary trends in Western Europe from Dante to Calderón, and their relationship to French literature. Readings, papers, and discussion.

231–32 *Theater in the Seventeenth Century* (3–3) Clubb
1962–63 and alternate years: academic year—day. A survey of the development of theatrical arts and the drama. Research papers and reports. Prerequisite: French 121–22 or the equivalent.

233 *Seminar: Seventeenth Century Literary Doctrines* (3) Clubb
Offered 1964–65. The origin and formation of literary doctrines and theories and their relationship to prose, poetry, and drama of the 17th century. Readings, discussions, and papers.

234 *Nondramatic Literature of the Seventeenth Century* (3)
Offered 1963–64. Rationalism and the revolt against authority expressed in literature. Discussion of texts and collateral readings.

240 *The Sentimental Current in the Eighteenth Century* (3) Meade
Offered 1964–65. Sentimentality in the novel and drama of 18th century France. English influences on French authors. The meaning of sentimentality and its later influences.

241 *The Rationalistic Current in the Eighteenth Century* (3) Meade
Offered 1964–65. Bayle, Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and the Encyclopedists as philosophers, dramatists, and critics of their age; an assessment of their contributions to the intellectual evolution of France and Europe.

242 *Seminar: the French Novel in the Eighteenth Century* (3) Meade
Fall—day. Development of the novel in France from *La Princesse de Clèves* to the French Revolution; themes and techniques.

243 *Voltaire and Rousseau* (3) Meade
Spring—day. Voltaire and Rousseau as representatives and critics of their age.

244 *Seminar: Diderot and the Encyclopedia* (3) Meade
Offered 1963–64. Diderot's contribution to 18th century novel, drama, and aesthetic criticism; the Encyclopedia as embodiment of 18th century thinking.

250 *Romanticism in France* (3) Frey
Fall—day. The theory and practice of romanticism in France: romantic love, the Napoleonic myth, exoticism, local color, sensationalism, and religiosity as reflected in new styles of prose and poetry Romantic criticism. The preparation for realism.

251 *Realism and Naturalism* (3) Frey
Spring—day. Prose style in the French novel from Balzac to Zola; the influence of history, science, philosophy, and art on the literary doctrines of realism and naturalism; realistic currents with romanticism; the minor realists and naturalists; realism in poetry and in the theatre.

252 *Seminar: Flaubert* (3) Frey
Offered 1964–65. Reading and analysis of the works of Flaubert from *Mémoires d'un fou* to *Bouvard et Pécuchet*, plus selected correspondence. Romantic elements in the works of Flaubert; Flaubert and the impersonality of the writer, the doctrine of art for art, Bovarysme, style indirect libre. Contemporary criticism of Flaubert.

253 *Seminar: Symbolism in Poetry* (3) Clubb
Offered 1964–65. The origin and nature of symbolism from Baudelaire to Valéry. Class analysis of texts and reports. Prerequisite: French 127–28 or the equivalent.

254 *Seminar: Victor Hugo* (3) Frey
Offered 1964–65. Hugo and the development of the romantic ideal in prose and poetry; Hugo and romantic theater and criticism. Analysis, classification, and criticism of romantic themes and techniques in the works of Hugo; contemporary Hugo criticism.

255 *Seminar: Stendhal and Le Beylisme* (3) Clubb
Spring—day. Stendhal's novels and autobiographical works. Stendhal and his public. Readings, discussions, and papers.

SPANISH

First Group

1–2 *First-year Spanish* (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester.

3–4 *Second-year Spanish** (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural

* Spanish 3–4 is required, and Spanish 51–52 is recommended, as prerequisite to all second-group courses in Spanish.

training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester. Prerequisite: Spanish 1–2 or two years of high school Spanish.

9–10 *Spanish Conversation and Composition* (3–3) The Staff
Academic year—day and evening. Prerequisite: Spanish 4 or the equivalent and permission of the instructor.

49 *Spanish Readings for Nonmajor Students* (3) The Staff
Fall—evening; spring—evening. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51–52 *Survey of Spanish Literature and Civilization** (3–3) Supervía
1962–63 and alternate years: academic year—day. 1963–64 and alternate years: academic year—evening. The social, artistic, and cultural background of Spanish civilization. Lectures, readings, recitations, and informal discussion.

SECOND GROUP*

109–10 *Advanced Spanish Conversation and Composition* (3–3) Mazzeo
Academic year—day. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: Spanish 10 or the equivalent and permission of the instructor.

121–22 *Spanish Literature of the Golden Age* (3–3) Supervía
1963–64 and alternate years: academic year—day. Lope de Vega, Calderón; the classic drama, the ballad, lyric poetry, prose. Class analysis of texts, collateral reading, lectures on literature and history.

123–24 *Cervantes: Don Quijote* (3–3) McSpadden
1962–63 and alternate years: academic year—day. Life and works of Cervantes: the *Quijote* and its relationship to other works of the Golden Age. Lectures, discussions, and reports.

125–26 *Modern Spanish Literature* (3–3) Mazzeo
1962–63 and alternate years: academic year—evening. 1963–64 and alternate years: academic year—day. Prose and poetry of the 18th and 19th centuries. Class analysis of texts, collateral reading, lectures on literature and history.

127–28 *Contemporary Spanish Literature* (3–3) Supervía
1963–64 and alternate years: academic year—day. Prose and poetry of the 20th century. Class analysis of texts, collateral reading, lectures on literature and history.

129 *The Romantic Drama in Spain* (3) Mazzeo
Summer 1962 and alternate summers—evening. Class analysis of texts, collateral reading and lectures on the Spanish Romantic Drama.

151–52 *The Spanish-American Novel* (3–3) ———
1962–63 and every third year: academic year—as arranged. Development of the novel in Spanish America. Lectures, collateral reading, and class analysis of texts.

155–56 *Spanish-American Literature to 1880* (3–3) Robb
1963–64 and every third year. The literature of Spanish America from the colonial period to the latter part of the 19th century. Lectures, collateral reading, reports, and class analysis of important works.

157–58 *Spanish-American Literature since 1880* (3–3) Robb
1964–65 and every third year. The literature of Spanish America from 1880 to the contemporary period. Lectures, collateral reading, reports, and class analysis of important works.

* Spanish 3–4 is required, and Spanish 51–52 is recommended, as prerequisite to all second-group courses in Spanish.

275–76 *Comparative Romance Languages and Literatures III–IV (Portuguese)* (3–3) Robb

Academic year—day. For candidates for the degree of Doctor of Philosophy. Lectures, discussions, exercises, and readings.

277–78 *Comparative Romance Languages and Literatures V–VI (Portuguese)* (3–3) Robb

Offered 1963–64. For candidates for the degree of Doctor of Philosophy. Portuguese and Brazilian literatures from Camões to the 20th century.

279 *Introduction to Romance Philology and Linguistics* (3) McSpadden

1962–63 and every third year: fall—day. Study of principles found in the development of the Romance languages and methods of analysis at the present time. A general course for graduate students in the fields of the Romance languages and literatures. Prerequisite: an elementary knowledge of Latin. This course is normally followed by French 212 or Spanish 212.

280 *Introduction to Romance Stylistics* (3) Frey

Offered 1964–65. Special emphasis will be placed on examples from French and Spanish literature.

283 *Problems of Teaching Romance Languages and Literatures in College* (3) McSpadden

Fall—day. For candidates for the degree of Doctor of Philosophy. Principles and problems of learning and teaching the language and literature. Apprenticeship in college classes and the language laboratory.

SECRETARIAL STUDIES*

Associate Professor Mildred Shott *(Chairman)*
Lecturer Amil Jackowski
Associates W. R. Throckmorton, Ruth Osborne

Associate in Arts (Two-year vocational curriculum in Secretarial Studies).—For curriculum, see page 58.

Associate in Secretarial Administration.—See the College of General Studies Catalogue for complete details.

Bachelor of Arts in Education with a teaching field in Business Education.—Prerequisite: the Education curriculum, pages 54–55.

Required: the Business Education option and the professional courses listed in the School of Education Catalogue.

1 *Elementary Typewriting* (3) Shott and Staff

Fall—evening; spring—evening. Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms. Laboratory fee, $7.

2 *Intermediate Typewriting* (3) Shott and Staff

Fall—evening; spring—day and evening. The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents. Prerequisite: Secretarial Studies 1 or the equivalent; ability to type accurately at 30 words a minute. Laboratory fee, $7.

11 *Elementary Shorthand and Transcription* (3) Shott and Staff

Fall—day and evening; spring—evening. A study of the principles of Gregg shorthand correlated with dictation and transcription. *Minimum* dictation speed of 60 words a minute attained. Laboratory fee, $3.

* The Staff of Instruction here listed is for the academic year 1961–62

12 *Intermediate Shorthand and Transcription* (3) Shott and Staff
Fall—evening; spring—day and evening. Review of the principles of Gregg shorthand. Dictation and transcription on general and specialized business subjects. *Minimum* dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute. Laboratory fee, $5.

15 *Advanced Shorthand, Typewriting, and Transcription* (3) Shott
Fall—day. Dictation and transcription involving vocabularies in specific businesses. *Minimum* speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent. Laboratory fee, $5.

16 *Secretarial Shorthand, Typewriting, and Transcription* (3) Shott
Spring—day. Dictation and transcription involving vocabularies used in the legal and medical professions. *Minimum* dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 15 or the equivalent. Laboratory fee, $5.

51 *Business Correspondence* (3) Shott
1962–63 and alternate years: fall—day. 1963–64 and alternate years: fall—evening. Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.

54 *Secretarial Practice* (3) Shott
Spring—day. A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

SLAVIC LANGUAGES AND LITERATURES *

Associate Professor Helen Yakobson *(Chairman)*
Lecturers Kiril Jaszenko, George Olkhovsky, Vadim Medish, Natalie Kalikin, Irene Bodrov, M. I. Filipovitch

Bachelor of Arts with a major in Russian (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53.
Required: in addition to the general requirements, pages 58–62, Slavic Languages 91–92, 179–80; six hours of History selected from History 143, 145 or 146; and eighteen semester hours to be selected from second-group courses in Russian.
Russian majors are expected to have a reasonable proficiency in spoken and written Russian, a firm grasp of the fundamentals of Russian grammar, a general comprehension of Russian history, and a general knowledge of Russian literature, as well as some first-hand acquaintance with writings of major Russian writers. Students who are already proficient in Russian, may upon passing an appropriate examination, waive any or all of the first-group language courses, as well as up to six hours of second-group language courses.
Bachelor of Arts in Education with a minor teaching field in Russian.—Prerequisite: the Education curriculum, pages 54–55.
Required: the professional courses listed in the School of Education Catalogue.

First Group

1–2 *First-year Russian* (3–3) Yakobson and Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening; summer 1962. *Second half:* fall—evening; spring—day and evening; summer 1962. A beginners' course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in electronic language workshop. Workshop fee, $6 a semester.

* The Staff of Instruction here listed is for the academic year 1961–62.

3–4 *Second-year Russian* (3–3) **Yakobson and Staff**
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening. *Second half:* fall—evening; spring—day and evening. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Workshop fee, $6 a semester.

9–10 *Russian Conversation* (3–3) **Olkhovsky**
Academic year—evening; summer 1962. Listening comprehension and oral practice. Prerequisite: Russian 3–4 or permission of the instructor. Workshop fee, $6 a semester.

91–92 *Introduction to Slavic Literature* (3–3) **Medish, Filipovitch**
Academic year—day and evening. Lecture, recitation, and discussion. *First half:* a survey of Russian literature in translation from early periods through the literary masterpieces of the 19th century. *Second half:* a survey of other Slavic literatures, 18th century to the present, with emphasis on the contemporary scene.

SECOND GROUP

101–2 *Readings in Modern Russian* (3–3) **Medish**
1963–64 and alternate years. Representative Russian readings in the social sciences and periodical literature.

103–4 *Scientific Russian* (3–3) **Medish**
1963–64 and alternate years. Readings in the major fields of Russian contemporary scientific literature.

109–10 *Advanced Russian Conversation and Composition* (3–3) **Yakobson**
Academic year—evening. Developing proficiency in oral and written expression. Prerequisite: Russian 10.

141–42 *Russian Literature of the 19th Century* (3–3) **Yakobson**
1962–63 and alternate years: academic year—day and evening. Lectures, special reports, class analysis of selected works of 19th century Russian literature—in Russian. Prerequisite: Russian 1–2, 3–4.

151–52 *Russian Literature of the 20th Century* (3–3) **Yakobson**
1963–64 and alternate years. Lectures, special reports, class analysis of selected works of 20th century Russian literature—in Russian. Prerequisite: Russian 1–2, 3–4.

179–80 *Advanced Grammar and Composition for Russian Majors* (1–1) **Yakobson**
Academic year—as arranged.

SOCIOLOGY AND ANTHROPOLOGY*

Professor H. L. Geisert
Associate Professor R. W. Stephens *(Acting Chairman)*
Assistant Professors J. M. Campbell, Samuel Baum, P. F. Gallagher
Lecturers Jane Wickey, J. A. Bartolini

Bachelor of Arts with a major in Sociology and Anthropology (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including six hours in first-group courses in Sociology and Anthropology.

Required: in addition to the general requirements, pages 58–62, twenty-four semester hours in Sociology and Anthropology, which must include 172 and 181.

Master of Arts in the field of Sociology and Anthropology.—Prerequisite: the degree

* The Staff of Instruction here listed is for the academic year 1961–62.

of Bachelor of Arts with a major in Sociology and Anthropology in this University or the equivalent.

Required: the requirements, pages 64–66, including a minimum of eighteen hours in third-group courses.

First Group

1–2 *Man in Modern Society** (3–3) — The Staff

First half: fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening. Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national, and international disorganization.

51 *Introduction to Anthropology** (3) — The Staff

Fall—day and evening; spring—day and evening; summer 1962. Physical development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships.

Second Group

115 *Cultural Anthropology* (3) — Campbell

Fall—day. Development of social life and customs in preliterate societies, universals, and aspects of culture; theories relating to culture, society, and personality.

116 *Native Peoples of the New World* (3) — Campbell

Spring—day. A survey of representative Indian groups of the Americas from primitive bands to high civilizations, stressing the patterned nature of diverse cultural responses to universal problems of human existence.

123 *Fields of Social Work* (3)

1963–64 and alternate years. Introduction to the nature and scope of social work; the development of social work program; functions of social case work, social group work, and social action.

124 *Medical Sociology* (3) — Wickey

Spring—day. Sociological factors and processes which relate to physical and mental health and disease; analysis of patterned social relationships in the field of health and medicine; the hospital as a social system.

126 *Urban Sociology* (3) — Baum

1962–63 and alternate years: spring—day. The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.

127 *Community Organization* (3)

1963–64 and alternate years. Principles common to communities throughout the world: social interaction and social disorganization, population growth and community structure, spatial organization, community change.

131 *Social Institutions* (3)

1963–64 and alternate years. Functional analysis of basic social institutions: family, education, religion, economy, and state in the structure of American society.

132 *Courtship and Marriage* (3) — Stephens

1963–64 and alternate years. Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.

133 *The Family in Modern Society* (3) — Baum

1963–64 and alternate years. Historical development of the family as a social institution, parent-child relations, family problems, disorganization and divorce, and family reorganization.

* Sociology and Anthropology 1 or 51 is prerequisite to all other courses in Sociology and Anthropology.

134 *Sociology of Child Development* (3) Stephens
1963–64 and alternate years. Socialization of the child through the home and other social institutions; the changing status of childhood, dependent and handicapped children.

135 *Juvenile Delinquency* (3) Wickey
1962–63 and alternate years: fall—day. Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.

136 *Criminology* (3)
1963–64 and alternate years. Nature and distribution of crime, police and court systems, prisons and reformatories; treatment and prevention of crime.

141 *Population Problems* (3) Baum
1962–63 and alternate years: fall—day. Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies: eugenics and birth control.

142 *Race and Culture Configurations* (3) Gallagher
Spring—day. The biological background; the origin and races of mankind, and the social and cultural effects of concepts of race.

143 *Language and Culture* (3) Gallagher
Summer 1962. The nature and significance of human communication, the distribution and dynamics of languages, linguistic changes, the role of language in culture.

144 *Mass Communications* (3) Baum
1963–64 and alternate years. The communications process; barriers to communication; structure and function of communication in society; content, control, support, and effects of mass communication.

151 *Human Relations in Industry* (3) Stephens
1963–64 and alternate years. Sociological analysis of work situations, occupational mobility, development of the labor movement, industrial leadership and morale.

152 *Dynamics of Culture* (3) Campbell
1962–63 and alternate years: spring—evening. Factors and processes making for stability and change in cultures; "the nature and characteristics of cultural growth invention, diffusion, and acculturation"; the integration and disintegration of cultures.

153 *Culture and Personality* (3) Gallagher
Fall—evening. Influences of group membership and cultural conditions on personality; socio-cultural factors in mental health; the relationship of personality to class, caste, and occupation.

155 *Applied Anthropology* (3) Gallagher
1962–63 and alternate years: fall—day. The application of anthropological methods and techniques in the modern world. The use of applied anthropology in specific fields, including government, business, law, and medicine.

161 *Social Stratification: Class and Status* (3) Stephens
1962–63 and alternate years: fall—day. Nature of class structure patterns of status, prestige relations in American society, differential class behavior, analysis of comparative social structure and social mobility.

162 *Social Movements* (3) Stephens
1962–63 and alternate years: spring—day; summer 1962. Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and show the way social movements develop.

164 *Social Control* (3)
1963–64 and alternate years. Informal and formal phases of human control, analysis of methods of control used in modern society and the situations in which they occur, policies and techniques of control.

172 *Contemporary Social Theory* (3) Stephens
Spring—evening. Systematic study of the important schools of contemporary sociology, including recent European as well as American developments; an evaluation of the scientific contributions of each school.

181 *Methods of Social Research* (3) Stephens
Fall—evening. Analysis of social research techniques and the scientific method; application to social data of the case study, social survey, statistical, sociometric, and experimental methods.

THIRD GROUP

221 *Seminar: Current Trends in Sociology* (3) Geisert
1962–63 and alternate years: fall—evening. Analysis and evaluation of recent developments in sociology and an appraisal of the role of systematic theory in sociology.

222 *Seminar: Anthropological Theory* (3) Gallagher
1962–63 and alternate years: spring—evening. Analysis of the theoretical postulates and assumptions underlying the development of modern cultural and social anthropology.

223 *Cultural Origins of the Western Hemisphere* (3)
1963–64 and alternate years. An examination of the problems of the nature and time of Early Man's entry to the Americas; the development of Paleo Indian societies, stressing their varied cultural adjustments to diverse environments.

224 *Anthropological Methods* (3)
1963–64 and alternate years. Traditional approaches to library and field research in linguistics, archeology, and ethnography; conceptual bases and bias in the delineation of problems, in the selection, analysis and organization of data, and in the preparation of the final report.

225 *Seminar: Small Groups* (3)
1963–64 and alternate years. General characteristics of small groups and their measurement; sociography of groups, evaluation of small group theory and sociometry; other techniques of small group research.

226 *Problems of Underdeveloped Areas* (3)
1963–64 and alternate years. Characteristics and problems of underdeveloped areas; the interrelationship of demographic, economic, social, and cultural factors; measures and techniques to introduce cultural changes.

227 *Religious Beliefs of Preliterate Peoples* (3) Campbell
1962–63 and alternate years: fall—evening. Conceptions of the supernatural in nonliterate societies. An examination of religious beliefs and practices; the interrelatedness of religion, magic, and philosophy.

228 *Criminal Behavior: Research and Theory* (3) Geisert
1962–63 and alternate years: spring—evening. A re-evaluation of theories of criminal and deviant behavior based on recent research findings; implications for the correction and prevention of criminal behavior.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged: summer 1962.

SPEECH*

Professors L. P. Leggette *(Chairman)*, C. W. Pettit *(Director of Speech Clinic)*, G. F. Henigan, Jr., E. L. Stevens

Professorial Lecturer Zelda Fichandler

Associate Professor Lee Bielski

Associate Professorial Lecturers F. C. Strickland, Zelda Kosh

Lecturers Edith Surrey, A. A. Nilles, S. L. Berlinsky, Isabel Burger, R. E. Shutte, H. C. Krebs, L. W. Shollenberger

Associates Joan Regnell, Lois Richards, Marjorie Prussing

Bachelor of Arts with a major in Speech (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including Speech 1, 2, 11, 32.

Required: the general requirements, see pages 58–62, including the passing of a speech proficiency test early in the program; Speech 101, 121, 154, 171; and a minimum of twelve additional hours in second-group courses in the speech arts or speech science, as approved by the adviser.

Bachelor of Arts with a major in Dramatic Art (Departmental).—Prerequisite: the Arts and Letters curriculum, pages 52–53, including twelve hours in the basic courses in speech and six hours in English 51–52, 71–72, or 91–92.

Required: the general requirements, pages 58–62, including the passing of a speech proficiency test early in the program. Speech 101–2, a minimum of nine additional hours in theater arts in the Speech Department and nine hours in dramatic literature in the English Department, as approved by the adviser.

Master of Arts in the field of Speech Correction.—Prerequisite: the degree of Bachelor of Arts with a major in Speech from this University, or the equivalent.

Required: the general requirements, pages 64–66.

Master of Fine Arts in the field of Dramatic Art.—Prerequisite: the degree of Bachelor of Arts from this University, or the equivalent.

Required: the general requirements, see pages 64–66, twelve hours of second- and third-group courses in drama and dramatic literature offered on campus, and twelve hours in theatre offered at the Arena Stage.

Four semesters in residence are required to complete this program. For detailed information, consult the Chairman of the Department.

Bachelor of Arts in Education with a teaching field in Speech.—Prerequisite: the Education curriculum, pages 54–55.

Required: the Speech option and the professional courses listed in the School of Education Catalogue.

First Group

A *Speech Clinic* Pettit, Bielski

Academic year—as arranged; summer 1962. Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, $7; for group lesson, $4.

B *American Speech for Foreign Students* (3) Bielski

Fall—day and evening; spring—day and evening; summer 1962. Class limited to foreign-born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Recording fee, $5.

1 *Effective Speaking* (3) Leggette and Staff

Fall—day and evening; spring—day and evening; summer 1962. Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, $2.

2 *Persuasive Speaking* (3) Henigan and Staff

Fall—day; spring—day and evening. A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

* The Staff of Instruction here listed is for the academic year 1961–62.

11 *Voice and Diction* (3) **The Staff**
Fall—day and evening; spring—day and evening; summer 1962. Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, $4.

32 *Oral Reading* (3) **Leggette and Staff**
Fall—day; spring—day and evening; summer 1962. Reading to others, theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11. Recording fee, $2.

SECOND GROUP

101 *Voice and Phonetics* (3) **Bielski**
Fall—day. The International Phonetic Alphabet and its applications to the student's own speech improvement; also its application to such fields as theater, public speaking, speech correction, radio, television, and foreign languages. Prerequisite: Speech 11. Recording fee, $4.

102 *Oral Interpretation of Literature* (3) **Leggette**
Spring—day. Theory and practice in the problems of communicating meaning and emotion. Selections for study include poetry and prose. Prerequisite: Speech 32. Recording fee, $2.

111 *Effective Speech Communication* (3) **Bielski**
Not offered 1962–63. The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to speech majors.

121 *Group Discussion and Conference Leadership* (3) **Stevens**
Fall—day; spring—evening; summer 1962. The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor.

126 *Public Discussion and Debate* (3) **Henigan**
Spring—day. Principles and types of public discussion and debate; practice in argumentative speaking on questions of current interest. Prerequisite: 6 hours of speech or the permission of the instructor.

127–28 *Advanced Debate Practice* (1–1) **Henigan**
Academic year—as arranged. Admission by permission of the instructor, after one semester of satisfactory participation in the intercollegiate debate program. This course may be repeated for a total of 4 semester hours.

133–34 *Radio and TV Broadcasting* (3–3) **Shollenberger**
Academic year—evening. A study of the development of the radio and TV industries, station organization and management, equipment, production techniques; practice in the preparation and performance of radio programs. Recording fee, $5 a semester.

141 *Public Speaking: Advanced Forms* (3) **Henigan**
Spring—day. The preparation and presentation of speeches for formal occasions with emphasis on the psychology of the audience. Prerequisite: 6 semester hours of speech.

145 *Speech Criticism* (3) **Henigan**
Not offered 1962–63. A study of rhetorical theory with application to the criticism of representative American and British oratory. Admission by permission of the instructor.

153 *Acting* (3) **Strickland**
Fall—evening. Study and practice in the fundamentals of acting technique. Prerequisite: Speech 32. Laboratory fee, $5.

154 *Play Production* (3) Strickland
Spring—evening. Fundamentals of play production. Under the supervision of the instructor, students prepare one-act plays for presentation. Laboratory fee, $5.

155–56 *Play Production Practice* (1–1) The Staff
Academic year—as arranged. Practical work in theater.

166 *History of the Theater* (3) Nilles
Spring—evening. A general survey of the rise of the theater, the Classical, Medieval, Renaissance, later English and Continental, and the Modern theater.

169 *Creative Dramatics* (3) Prussing
Fall—evening. A study of creative dramatics and its use as a learning tool.

170 *Children's Theater* (3) Burger
Spring—evening. Theory and practice in creating and producing plays for children.

171 *Introduction to Speech Correction* (3) Petti
Fall—evening. A survey of the disorders of speech, including symptomatology, testing, causation, and therapy.

173–74 *Speech Therapy* (3–3) Bielski
Academic year—day. Clinical techniques and procedures involved in the correction of the disorders of speech. Prerequisite: Speech 101 and 171.

176 *Speech Correction* (3) Petti
Spring—evening. Advanced study of the disorders of speech. Prerequisite: Speech 171 and 173.

177–78 *Clinical Practice in Speech Therapy* (1–1) The Staff
Academic year—as arranged; summer 1962—Speech 177 (1). Supervised case work in remedial speech—the University Speech Clinic, Children's Hospital, District of Columbia Crippled Children's Society, and Public School system. Weekly meetings to discuss therapeutic techniques for the common speech problems. This course may be repeated for a total of 4 semester hours. Prerequisite: Speech 101, 171, 173, and permission of the instructor.

182 *Hearing Problems and the Testing of Hearing* (3) Shutts
Fall—evening. A study of the field of audiology with emphasis on the testing of hearing.

183–84 *Clinical Practice in Hearing Therapy* (1–1) The Staff
Academic year—as arranged; summer 1962—Speech 183 (1). Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and Children's Hospital. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of the instructor.

Third Group

251 *Rehearsal and Performance* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. A course putting into practice the principles and techniques of acting through participation in play rehearsals and performances at the Arena Stage. Admission by audition or interview.

254 *Directing Problems* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Observation and participation in solving the problems involved in directing plays. Admission by interview.

255 *Techniques of Staging* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Application of theory and principles of scene design, costuming, lighting, make-up, and related stage techniques. Admission by interview.

263 *Theater Management* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Theory and practice in the psychology of handling the public: promotion, box office and house management. Admission by interview.

264 *Producing Problems* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Problems involved in producing community and professional theater. Admission by interview.

279 *Speech Science* (3) Berlinsky
Fall—evening. The anatomy, physiology, physics, and psychology of speech production, with a survey of experimental work.

280 *Speech Pathology* (3) Pettit
Summer 1962. An advanced study of the causes and symptoms of the major physiogenic and psychogenic disorders. Prerequisite: Speech 171 and 176.

284 *Speech Reading and Auditory Training* (3) Shutts
Spring—evening. Theory and practice in speech reading and auditory training with an analysis of methods used for the instruction of hearing handicapped children and adults. Prerequisite: Speech 182.

286 *Seminar in Speech Pathology* (3) Pettit
Spring—evening.

294 *Research in Dramatic Art* (arr.) The Staff
Spring—as arranged.

295–96 *Research in Speech and Hearing* (arr.) The Staff
Summer 1962—Speech 295 (arr).

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses the University offers the following course, which is available to personnel in the U. S. Navy and Marine Corps.

111 *Effective Speech Communication* (3)

Related Courses in Other Departments

English 125, *Introduction to English Linguistics* (3)

English 135–36, *Shakespeare* (3–3)

English 175–76, *American Drama* (3–3)

English 183–84, *The English Drama* (3–3)

English 235–36, *Studies in Shakespeare and His Contemporaries* (3–3)

Education 134, *Student Teaching in Secondary Schools* (6 to 9)

Education 152, *Teaching Speech* (2 to 4)

STATISTICS*

Professors F. M. Weida *(Emeritus)*, E. H. Johnson, H. F. Bright *(Chairman)*
Professorial Lecturers Solomon Kullback, Samuel Greenhouse
Associate Professorial Lecturers Seymour Geisser, Morton Kupperman, Arnold Heyl
Assistant Professor R. E. Thomas
Lecturers S. J. Armore, Fred Frishman, H. F. Sieber, Jr., W. M. Wolman

Bachelor of Arts or *Bachelor of Science with a major in Mathematical Statistics (Field-of-Study).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53, including Mathematics 23 or 30; Statistics 91.

Required: the general requirements, pages 58–62, including Mathematics 24; Statistics 117, 118, 155, 157–58, and six additional hours of second-group Statistics courses selected with the approval of the adviser; a minimum of twenty-four semester hours of courses in other departments approved by the adviser as contributing to a well-organized program; and the grade of "pass" on the major examination at the end of the senior year. For further details, consult the adviser.

Master of Arts or *Master of Science in the field of Mathematical Statistics.*—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Mathematical Statistics at this University, or the equivalent.

Required: the general requirements, pages 64–66, including a thesis in Statistics and at least twelve hours to be selected from approved third-group courses in Statistics. The remaining twelve hours must be selected in consultation with the adviser.

Doctor of Philosophy.—See pages 67–73.

Bachelor of Business Administration or *Master of Business Administration with a major in Business and Economic Statistics.*—See pages 130–31, 135, 135–37, 139.

First Group†

51 *Introduction to Business and Economic Statistics* (3) — The Staff

Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening; summer 1962. Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

52 *Mathematics of Finance* (3) — The Staff

Lecture (3 hours). Fall—day and evening; spring—day and evening. Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra.

53 *Introduction to Statistics in Psychology and Education* (3) — The Staff

Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

91 *Principles of Statistical Methods*‡ (3) — Thomas

Lecture (2 hours), laboratory (2 hours). Fall—evening; spring—day. Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

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* The Staff of Instruction here listed is for the academic year 1961–62.

† Of first-group courses, Statistics 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Statistics 52 lies outside of this group, and may be taken for degree credit in combination with any one of the other three.

‡ Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

Second Group

104 *Statistics in Psychology and Education I* (3) Bright
Lecture (2 hours), laboratory (2 hours). Fall—Saturday morning; summer 1962. Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, $9.

105 *Statistics in Psychology and Education II* (3) Bright
Lecture (2 hours), laboratory (2 hours). Spring—Saturday morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53 or 104. Laboratory fee, $9.

106 *Factor Analysis* (3)
Summer 1962. Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, $9.

107 *Statistics for Engineers* (3) The Staff
Fall—evening; spring—evening; summer 1962. Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

109 *Managerial Statistics* (3)
Not offered 1962–63. Role of statistics and the contribution of statistical procedures in various phases of business management with emphasis on the need for and usefulness of the statistical method rather than the mechanics of analysis. Subject matter comprises sources and methods for collecting data, effective forms of presentation, techniques for summarizing and analyzing quantitative and qualitative information, interpretation of and inferences from available data. Admission by permission of the instructor or following Statistics 51.

110 *Quality Control Techniques* (3)
Not offered 1962–63. Applications of probability and distribution theory to industrial control problems; use of quality control charts; acceptance sampling plans; estimation of lot and process characteristics. Prerequisite: Statistics 51 or permission of instructor.

111 *Business and Economic Statistics I* (3) Johnson
Fall—day and evening. Statistical processes as related to the problems of business and economic research with emphasis on decision making under conditions of uncertainty. Topics include averages, dispersion, analysis of variance, correlation, quality control, and index numbers. Prerequisite: Statistics 51 or permission of instructor.

112 *Business and Economic Statistics II* (3) Johnson
Spring—day and evening. Specific problems of business and economics with statistics as a tool of analysis. Introduction to principles and use of linear programming, game theory and queueing theory techniques. Study of various economic relationships, including demand, supply, cost and price functions. Prerequisite: Statistics 111 or equivalent.

117 *Analysis of Variance I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening. The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Prerequisite: Statistics 91. Laboratory fee, $9.

118 *Correlation and the Chi-square Test I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Spring—evening; summer 1962. Regression and correlation theory: simple, partial, and multiple; nonparametric methods; analysis of covariance; contingency table analysis; tests of goodness of fit. Prerequisite: Statistics 91. Laboratory fee, $9.

121 *Index Numbers* (3)
Not offered 1962–63. Definition and theory of index numbers, methods of construction, their interpretation, use, and limitations. Prerequisite: Statistics 51 or the equivalent.

122 *Forecasting Principles and Techniques* (3) Johnson
Spring—day. Survey and appraisal of techniques for measuring the state of business conditions and an examination of current indicators. Study of procedures for estimating future values: budget requirements, price levels, or level of general business activity. Prerequisite: Statistics 51 or the equivalent.

123 *Introduction to Econometrics* (3) Johnson
Fall—day. A basic quantitative approach to fundamental problems in economic theory involving the use of statistical processes, simple model construction, and probability considerations. Prerequisite: elementary course in Economics and Statistics.

155 *Introduction to Mathematical Probability* (3) The Staff
Fall—day; spring—evening; summer 1962. Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers. Prerequisite: permission of instructor.

157–58 *Mathematical Statistics* (3–3) Kupperman
Academic year—day and evening. Distribution theory, sampling theory, estimation, hypothesis testing, confidence methods, regression analysis, experimental design. Prerequisite: differential and integral calculus.

189–90 *Mathematical Probability and Applications* (3–3) Geiser
Academic year—evening. Combinatorial analysis, conditional probability and stochastic independence, probability distributions, laws of large numbers, recurrent events, random walks, Markov chains, simple time-dependent stochastic processes. Prerequisite: Statistics 155 or permission of instructor.

191 *Statistical Mathematics I** (3) Bright
Fall—evening. Problems in statistics with the development of processes from modern algebra necessary for their solution. Prerequisite: differential and integral calculus or permission of instructor.

192 *Statistical Mathematics II* (3)
Lecture (2 hours), laboratory (2 hours). Not offered 1962–63. Linear computations as applied to least squares, multiple correlation, regression, and analysis of variance problems. Prerequisite: Statistics 191 or the equivalent. Laboratory fee, $9.

193 *Statistical Mathematics III** (3) The Staff
Spring—evening. Problems in statistics with the development of real variable theory necessary for their solution. Prerequisite: differential and integral calculus.

194 *Statistical Mathematics IV** (3) The Staff
Fall—evening. Problems in statistics with the development of complex variable theory necessary for their solution. Prerequisite: differential and integral calculus.

195–96 *Reading and Research in Statistics* (arr.) The Staff
Academic year—as arranged.

199–200 *Proseminar: Theoretical and Applied Statistics* (3–3) The Staff
Not offered 1962–63. In addition to the study of recent advances in statistical methods, this course is designed to coordinate the content of the baccalaureate major. Admission by permission of the instructor.

THIRD GROUP*

201 *Design of Experiments* (3)
Not offered 1962–63. Relative merits of random, repeated, stratified, and double sampling; Fisher-Pitman method of randomization; randomized blocks; Latin squares; factorial design; confounding, partial confounding.

* Statistics 191, 193, and 194 or the equivalent are prerequisite to all third-group courses.

203–4 *The Theory of Econometrics* (3–3)
A year course; credit is not given for the first half until the second half is completed. Not offered 1962–63. Statistical methods applied to analysis of production, supply, and demand; utility and disutility; interest and taxation; exchange. Emphasis on interpretation of results in terms of probability, correlation, and regression of time series. Admission by permission of the instructor.

205–6 *Advanced Business and Economic Statistics* (3–3)
Not offered 1962–63. Application of statistical methods to specific problems utilizing case method when possible. Emphasis on source materials, role of statistical methods, techniques of analysis, interpretation and presentation of results. Original work is required of each student. Prerequisite: Statistics 112 or the equivalent.

207 *Operations Analysis* (3) Bright
Fall—evening. Basic concepts and techniques of operations analysis as applied to problems in business management and economic research. An introduction to the processes of linear programming, game theory, and queueing theory. Admission by permission of the instructor.

211 *Theory of Sampling* (3) Bright
Spring—evening. Problems of sampling and sample design. Admission by permission of the instructor.

212 *Nonparametric Statistical Inference* (3)
Not offered 1962–63. Spring—1964. Statistical inference when the form of the underlying distribution is unknown; sign tests; rank order statistics; theory of runs; nonparametric discriminant analysis.

217 *Analysis of Variance II* (3)
Not offered 1962–63. Advanced theory of the applications of the linear hypothesis to research problems. Distributions of the analysis of variance. Extensions to multiple classifications with unequal cell frequencies. Studies of multiple contrasts and their importance. Normal versus non-normal problems.

218 *Correlation and the Chi-square Test II* (3)
Not offered 1962–63. Spring 1965. Theoretical analysis of simple, partial, and multiple regression. Examination of various distributions encountered. Rank correlation techniques and their distributions. Distribution of the chi-square statistic.

257–58 *Advanced Mathematical Statistics* (3–3) Kupperman
Academic year—evening. Random variables and probability distributions, distribution functions and their properties, convergence theorems, regression and correlation, multivariate normal distribution, asymptotic and exact sampling distributions, estimation, hypothesis testing.

259–60 *Advanced Mathematical Probability* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Modern theories and asymptotic laws: elementary theory of definite integration; limit theorems in probability.

261–62 *Information Theory for Engineers* (3–3) Kullback
Academic year—evening. The elements of information theory and its statistical and probabilistic background from an elementary point of view (nonmeasure theoretic). Measures of information, entropy, and their properties. Discrete stochastic sources, message ensembles. The transmission of information, channels, channel capacity. Encoding and decoding including error detection and correction. The fundamental theorems of information theory.

263–64 *Statistical Inference* (3–3) Greenhouse
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Sample space; methods for estimating population parameters; fiducial inference and its application to testing hypotheses; valid, efficient, and exact estimation; Student's distribution; variance distribution; sampling statistics. Prerequisite or concurrent registration: Statistics 257–58 or the equivalent.

265–66 *Multivariate Analysis* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Tests of significance, generalized variance and covariance, tests of independence, canonical and vector correlations, multivariate, normal distribution, generalized Student's ratio, problems of estimation, applications to factor analysis.

267–68 *Characteristic Functions* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Fourier integrals, set functions, inversion formulas, limit theorems, applications to the distribution problem in statistics.

269 *Sequential Testing* (3)
Not offered 1962–63.

270 *Statistical Decision Theory* (3)
Not offered 1962–63.

271–72 *Statistical Information Theory* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shanon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing. Asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison or experiments. Kullback

273–74 *Stochastic Processes* (3–3)
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Fundamental notions of stochastic processes; random walks; Markov processes; differential processes; Gaussian processes; applications. The Staff

295–96 *Reading and Research* (3–3)
Academic year—as arranged. Admission by permission of the instructor. The Staff

299–300 *Thesis* (3–3)

Courses Offered in Special Programs

In addition to the regular courses announced above the University offers the following courses for students enrolled in the following special programs: Navy Graduate Financial Management Program, Air Force Advanced Management Program, Engineering Administration, and Hospital Administration.

101 *Basic Principles of Statistical Methods* (3)
Variables and attributes, averages and dispersion, elementary principles of sampling, introduction to the making of statistical decisions.

119 *The Bases of Statistical Decision Making* (arr.)
Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.

120 *Principles of Statistical Analysis* (3)
Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses.

250 *Managerial Statistics and Quality Control* (3)
The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

SURGERY*

Professors Brian Blades *(Chairman)*, C. T. Klopp
Clinical Professors W. S. McCune, V. M. Iovine, Alec Horwitz, G. A. Higgins, Jr., J. P. Adams, G. S. Letterman
Associate Professors P. C. Adkins, H. C. Pierpont
Associate Clinical Professors H. L. Feffer, J. R. Thistlethwaite, Don Wenger
Assistant Professors N. P. D. Smyth, T. C. Alford
Assistant Clinical Professors B. F. Dean, Jr., Carl Berg, J. S. Neviaser, J. B. Harrell, L. T. Peterson, Thomas Bradley, Murdock Head
Associates W. R. Morris, J. J. Weinstein, W. C. Meloy, K. H. Wood, Isabella Harrison, Maxine Schurter, Charles Keck
Instructor W. J. Cushing
Clinical Instructors C. D. Briggs, J. F. Conlon, D. C. Richtmeyer, Leon Gerber, E. A. Gould, A. B. Rohrbaugh, Jr., M. H. Kendrick, B. G. Brown, J. D. Hoyle, R. R. Smith, N. H. Isaacson, C. S. White, Jr., D. P. McCarty, J. M. Keshishian, R. L. Dow, L. R. Perna, T. M. Wright, D. C. Wherry, J. H. Sager, Frances Brennecke, J. P. Baker

284 *Surgical Physiology* — The Staff
Spring—2 hours a week. A clinical and laboratory course with particular emphasis on applied physiology.

323–24 *Surgical Pathology I* — Weiss
Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing surgical specimens.

373–74 *Clinical Clerkship I* — The Staff
Academic year—as arranged. The student is assigned and required to work up thoroughly the cases for diagnosis and treatment. D. C. General Hospital.

375–76 *Outpatient Surgical Clinic* — The Staff
Forty hours as arranged during academic year. Surgical clinic. D. C. General Hospital.

377 *Fractures and Orthopedics* — The Staff
Fall—1 hour a week. Lectures covering the field of fractures and orthopedics. D. C. General Hospital.

379–80 *Lectures in Surgery* — The Staff
Academic year—2 hours a week. D. C. General Hospital.

383–84 *Surgical Clinic* — Blades
Academic year—1 hour a week. Demonstration of various surgical diseases to the entire class. University Hospital.

473–74 *Clinical Clerkship II* — The Staff
Academic year—in rotation. Six weeks, University Hospital; three weeks, Mt. Alto Hospital.

479–80 *Surgical Staff Conferences* — The Staff
Academic year—Wednesday as arranged. University Hospital.

483–84 *Surgical Ward Rounds* — Blades
Academic year—1 hour a week. Demonstration of various surgical diseases to fourth-year clerks. University Hospital.

* The Staff of Instruction here listed is for the academic year 1961–62.

491 *Surgical Anatomy II* — Horwitz and Staff
Fall—1 hour a week for twelve weeks in rotation. Lectures for fourth-year clerks. University Hospital.

492 *Surgical Pathology II* — Newman
Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

UROLOGY*

Clinical Professors L. R. Culbertson *(Chairman)*, E. E. Ferguson
Associate Clinical Professor W. D. Jarman
Assistant Clinical Professors F. T. Reuter, Gilbert Ottenberg
Associate G. R. MacDonald
Clinical Instructors H. D. Wolff, Jr., H. P. Dorman, H. A. Goldberg, W. D. Oldham, John Kenealy

395–96 *Clinic* — The Staff
Clinical teaching and demonstrations on the care of urological patients with special emphasis on the pre- and post-operative management. Operative clinics and clinical teaching. D. C. General Hospital.

397 *Urology* — The Staff
Fall—1 hour a week. Lectures covering the entire field of urology including diagnosis, treatment, and morbid pathology.

495–96 *Clinic* — The Staff
Three hours a week, in rotation, as arranged during academic year. Clinical demonstrations, teaching in the Outpatient Department, and urological X-ray conferences, with special attention given to diagnostic procedures. University Hospital.

ZOOLOGY*

Professors I. B. Hansen *(Chairman)*, P. W. Bowman, Edith Mortensen, S. C. Munson
Professorial Lecturer K. C. Kates
Associate Professor A. H. Desmond
Lecturer J. R. Buchheit

Bachelor of Arts or *Bachelor of Science (Field-of-Study).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53, including Biology 1-2† and Chemistry 11–12.

Required: the general requirements, pages 58–62, and the grade "pass" on the Zoology major examination at the end of the senior year. The correlated knowledge upon which the student will be examined includes the following fields: (1) classification, structure, and ecological relations of animals, both invertebrate and vertebrate; (2) embryological development and life histories of important animal types; (3) general principles of physiology, heredity, and evolution; (4) the development of biological principles, hypotheses, and theories as revealed in the study of the history of zoology.

Bachelor of Arts or *Bachelor of Science with a major in Biology (Departmental).*—This interdepartmental major may be arranged in conjunction with the Department of Bo-

* The Staff of Instruction here listed is for the academic year 1961–62.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

any. Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 52–53, including Biology 1–2*, or the equivalent.

Required: in addition to the general requirements, pages 58–62, a minimum of twenty-four semester hours of second group courses in Zoology and Botany, as approved by the Chairman of either Department.

Master of Arts or *Master of Science in the field of Zoology.*—Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Zoology or Biology.

Required: the general requirements, pages 64–66.

Master of Arts or *Master of Science in the field of Biology.*—This interdepartmental field may be arranged in conjunction with the Department of Botany. Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Zoology, Botany, or Biology.

Required: the general requirements, pages 64–66.

Doctor of Philosophy (in a field of Zoology or Biology).—See pages 67–73.

Bachelor of Arts in Education with a teaching field in Biology.—Prerequisite: the Education curriculum, pages 54–55.

Required: the Biology option and the professional courses listed in the School of Education Catalogue.

BIOLOGY†

First Group

1–2 *Introductory Biology‡ (4–4)** — The Staff

An interdepartmental course. Lecture (2 hours), laboratory (4 hours).

Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.

Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.

This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

ZOOLOGY

Second Group†

101–2 *Invertebrate Zoology* (3–3) — Mortensen

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. A systematic study of invertebrate forms, including the morphology, classifications, life histories, and phylogenetic relationships. Material fee, $8 a semester.

103–4 *Comparative Vertebrate Anatomy* (3–3) — Desmond

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: academic year—day and evening; 1963–64 and alternate years: academic year—day. Lectures on the organ systems of the vertebrates, laboratory dissections of types. Material fee, $11 a semester.

107–8 *Organic Evolution (3–3)** — Bowman

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. A study of the theories of organic evolution and present ideas

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

† Biology 1–2 is prerequisite to all second-group courses in Zoology, except by permission of the instructor.

‡ Beginning with the academic year 1962–63, Biology 1–2 *Introductory Biology* (4–4) replaces Botany 1–2 *General Botany* (3–3) and Zoology 1–2 *Introduction to Zoology* (4–4). Botany 1–2 and Zoology 1–2 will be offered for the last time in the summer of 1962.

on the principle lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechanisms involved in this process from the fields of genetics and cytology.

115–16 *Cytology** (3–3) Bowman
Lecture and laboratory. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—Zoology 115 (3) (as Botany 115). Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Material fee, $8 a semester.

127 *Genetics** (3)
Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man.

140 *Cell Physiology** (3) Shropshire
Spring—evening. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12.

145 *Introduction to Vertebrate Embryology* (3) Hansen
Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—day and evening; summer 1962. Origin and early development of the individual, formation of organ systems. Emphasis on the frog, chick, and pig, with reference to the human embryo. Material fee, $11.

148 *Histology* (3) Desmond
Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: spring—day. 1963–64 and alternate years: spring—evening. An introduction to the microscopical anatomy of normal tissues and organs. Material fee, $11.

152 *Protozoa* (3) Mortensen
Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. Introduction to the protozoa: classification, life histories, and physiology, with special emphasis on free-living types. Material fee, $8.

155 *Parasitology* (3) Kates
Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. An introduction to the study of animal parasitology, with a survey of parasitic types from the protozoa through arthropoda. Material fee, $11.

161 *Entomology* (3) Munson
Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. A study of the elementary morphology, physiology, and ecology of insects, with an introduction to the taxonomy of the more important groups. Material fee, $8.

162 *Insect Physiology* (3) Munson
1963–64 and alternate years. Lectures and laboratory work on the physiology of insects. Admission by permission of the instructor. Material fee, $11.

171–72 *Special Problems* (3–3) The Staff
Academic year—as arranged. Written approval of the instructor is required. Material fee, $11 a semester.

199–200 *Proseminar* (3–3) The Staff
Academic year—day and evening. Designed to correlate and supplement the work of Zoology majors.

THIRD GROUP

201–2 *Seminar: Cytology** (3–3) Bowman
Academic year—evening. Students may

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

204 *Seminar in Invertebrate Zoology* (3) Mortensen
1962–63 and alternate years: spring—evening. A study of original publications on hormones of invertebrate animals.

214 *Advanced Invertebrate Zoology* (3) Mortensen
Not offered 1962–63. Lectures and laboratory work on problems in invertebrate physiology. Prerequisite: Zoology 101–2 or the equivalent. Material fee, $8.

247–48 *Morphogenesis* (3–3) Hansen
1962–63 and alternate years: academic year—evening. Lectures and class reports on experimental morphology. Prerequisite: Zoology 103–4 or the equivalent.

251 *Seminar in Vertebrate Zoology* (3) Desmond
1963–64 and alternate years. A study of current publications in the field of histophysiology.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962—Zoology 295 (3). Investigation of special problems.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962—Zoology 299 (3).

INDEX

A

Absence, regulations concerning
  SEE Attendance
Academic status of the University, 4
Accounting:
  Associate in Arts curricula in, 56, 57
  Bachelor of Business Administration curriculum in, 56, 133–34
  Courses, 165–68
  Master of Business Administration field in, 139
Achievement Tests, 9, 11, 14
Activities, student, 159–61
  SEE ALSO Special Bulletin
Administration, Officers of, xi–xii
Administrative Assistants, liii–lxii
Administrative Committees of the University, xii–xiv
Administrative Units, 4, 154–57
Admission, 8–19
Adult education, 3, 146–50
Advanced Placement Examination, 9–10, 15
Advanced Professional Certificate, 126
Advanced standing, 9–10, 12, 13, 15, 16, 105, 124, 126
Advisory system:
  In Columbian College of Arts and Sciences, 50
  In the Division of Special Students, 151
  In the School of Engineering, 97–98
Air Force:
  Advanced Management Program, 143, 148
  Reserve Officers Training Corps
    SEE Reserve Officers Training Corps
Air Science:
  Courses, 168–69
  Division of, 18, 151–54
American Institute for Property and Liability Underwriters, Inc., 143
American Literary and Cultural History, Master of Arts field in, 63, 221–22
American Thought and Civilization, major in, 58–60, 60–62, 221
Anatomy:
  Courses, 170–71
  Doctoral research in, 67–73
Anesthesiology courses, 171
Annual events, student, 161
Anthropology courses, 304–7
Art courses, 171–76
Arts and Sciences, College of,
  SEE UNDER Columbian College of Arts and Sciences
Assistants in Research and Instruction, xliii–xlvii
Attendance, 39
  SEE ALSO Colleges, Schools, and Divisions
Auditor, 22, 40, 41
Awards, 32–37

B

Bahavioral Sciences, Center for, 143
Biochemistry:
  Courses, 176–77
  Doctoral research in, 67–73
Biological Sciences, Doctoral research in, 67–73
Biology:
  Courses, 177–78, 179, 319
  Doctoral research in, 67–73
Biometric Laboratory, lii
Botany:
  Courses, 178–80
  Doctoral research in, 67–73
Buildings of the University, 5–7
Business Administration:
  Courses, 182–87
  Degree of Bachelor of, 133–35
  Degree of Doctor of, 142–43
  Degree of Master of, 138–42
Business and Economic Statistics, Master of Business Administration field in, 139
Business and Public Administration courses, 191

C

Calendar for 1962–63, v–viii
Cancer Detection Clinic, 6, 79
Cartography, 229–30
Change in program of studies, 40–41
Chapel, 159
Chemistry:
  Courses, 190–94
  Doctoral research in, 67–73
Civil Engineering:
  Courses, 207–10
  Curriculum in, 101–2
Classical Languages and Literatures courses, 194–95
Classification of students, 18–19, 50, 90
College Entrance Examination Board, 9–11
Colleges, Schools, and Divisions, 46–154
Columbian College of Arts and Sciences, 46–66
  Entrance requirements:
    Graduate Division, 11
    Lower Division, 10–11
    Upper Division, 11
Commencement
  SEE Graduation
Commercial Art, courses on, 175
Committees:
  Administrative, of the University, xii–xiv
  Of the Board of Trustees, x
  SEE ALSO UNDER Colleges, Schools, and Divisions
Community Services, College of General Studies Division of, 149, 156–57
Contents, Table of, iii–iv

Continuing Legal Education, 14, 94
Convocation
  See Graduation
Counseling:
  Center, 157
  Courses, 205, 287, 289, 290, 291
  Doctoral research in, 67–73
  Master of Business Administration option in, 141
Course numbers, explanation of, 164
Courses of Instruction, 164–321
Credit:
  Explanation of amount of, 161
  For Advanced Placement examinations, 9–10
  For professional courses, granted by Columbian College of Arts and Sciences, 59
  For summer school work, 41
  From other institutions, 10, 12, 13, 15
  Transfer of, within the University, 21, 41

D

Dance:
  Courses, 271, 273, 274
  Production Groups, 160
Dean's Honor List, School of Government, Business, and International Affairs, 131
Dean's List, Columbian College of Arts and Sciences, 49
Degrees:
  Associate in Arts, 51–58
    In Accounting, 51–52, 56, 57
    In Secretarial Studies, 51–52, 58
  Associate in Science, 51–52, 57–58
    In Home Economics, 57
    In Physical Sciences, 57–58
  Bachelor of Arts, 51–53, 58–60, 60–62
    In Education, 51–52, 54–55, 120–22
    In Government:
      In International Affairs, 51–52, 56, 130–32
      In Public Affairs, 51–52, 56, 130–31, 132–33
  Bachelor of Business Administration:
    In Accounting, 51–52, 56, 130–31, 133–34
    In Business Administration, 51–52, 56, 130–31, 134–35
    In Business and Economic Statistics, 51–52, 56–57, 130–31, 135
  Bachelor of Civil Engineering, 100–102
  Bachelor of Electrical Engineering, 100–101, 102
  Bachelor of Laws, 90–92
  Bachelor of Mechanical Engineering, 100–101, 103
  Bachelor of Science, 51–52, 58–60, 60–62
    In Engineering, 100–101, 103–4, 111–12
    In Home Economics, 51–52, 55, 122
    In Medical Technology, 51–52, 53, 54, 58–60, 62–63, 83
    In Pharmacy, 51–52, 54, 114–17
    In Physical Education for Men, 51–52, 55–56, 122–23
    In Physical Education for Women, 51–52, 55–56, 122–23
  Certificate:
    Advanced Professional, 126
    Engineering Technologist, 111
  Combined Bachelor of Arts and Doctor of Medicine, 60, 82
  Doctor of Business Administration, 142–43
  Doctor of Education, 126–28
  Doctor of Juridical Science, 94–95
  Doctor of Philosophy, 67–73
  Doctor of Science, 107–9
  Juris Doctor, 90 (footnote)
  Master of Arts, 63, 64–66
    In Education, 123–25
    In Government, 135–38
      In Economic Policy, 135–37, 138
      In International Affairs, 135–37, 138
      In Personnel Administration, 135–37, 141
      In Public Administration, 135–37, 138
      In Public Affairs, 135–37, 138
    Master of Business Administration, 135–37, 138–42
      In Accounting, 135–37, 139
      In Business and Economic Statistics, 135–37, 139
      In General Business Administration, 135–37, 139
      In Hospital Administration, 135–37, 139–40
      In Personnel Administration, 135–37, 141
  Master of Comparative Law, 93, 94
  Master of Engineering Administration, 104–5, 106–7
  Master of Fine Arts:
    In Dramatic Art, 64
    In Painting and Sculpture, 64
  Master of Laws, 93
  Master of Science, 63, 64–66
    In Engineering, 104–6
Departmental Clubs, 163
Dermatology courses, 196
Dishonesty, regulations concerning, 40
Dissertations, requirements for, 43
Distinction, degrees with, 44, 82, 90
Distinguished Air Force ROTC Cadet, 44
Distinguished Air Force ROTC Graduate, 44
Dormitories, 157–58
Dramatic Art, major in, 308
Dramatics:
  Courses, 309–10, 310–11
  University Players, 160
Drawing courses, 174–75
Driver Behavior Research Project, III

Dropping courses, 40–41, 98–99
In the School of Engineering, 98–99

E

Economic Policy, Master of Arts in Government curriculum in, 135–37, 138
Economics:
Courses, 196–99
Doctoral research in, 67–73
Education:
Courses, 200–207
School of, 118–28
Entrance requirements, 16–17
Teaching fields, 121
Educational Facilities of the University, 5–8
Educational Objectives
See under Colleges, Schools, and Divisions
Electrical Engineering:
Courses, 210–14
Curriculum in, 101, 102
Electronics Research Project, xlvii
Eligibility for student activities, 160
Emeritus Officers and Faculty, xv–xvi
Employed students, amount of academic work, 85, 98, 114, 119, 130
Employment, student, 37, 159
Endowment of the University, 2
Engineering:
Courses, 207–21
School of, 95–112
Entrance requirements, 14–16
Engineering Administration:
Courses, 214–16
Master's field in, 104–5, 106–7
Engineering Science courses, 216–18
Engineering Technologist Certificate, 111
English:
Correct use, 49, 100
Courses, 221–26
Doctoral research in, 67–73
Placement examination, 51, 222
Requirements, 52
Entrance requirements, 10–18
Examinations, 40
Advanced Placement, 9–10, 15
College Entrance Board, 9, 11, 14
For admission, 9–10, 11, 14, 21
For placement in language courses, 51
For qualifying for advanced standing or waiving curriculum requirements, 9–10, 15, 21, 52, 59, 131
Graduate Record, 9, 21, 43, 59–60, 104, 131
Physical, 42, 81, 154–55, 269, 272

F

Faculty, alphabetical list, xv–xlvii
Fees and financial regulations, 20–23
Fellowships, 23–26, 73
Finance courses, 197, 198, 199
Financial aid, 37–38
Financial Management, special program in, 143
Foreign Affairs
See International Affairs
Foreign Commerce, Bachelor of Business Administration Specialization in, 135
Foreign language:
Examination:
For Master's candidacy, 65
Placement, 51
Requirements, 52
Foreign Service, curricula in
See International Affairs
Foreign students, 93, 159
Fraternities, social, 163
French:
Courses, 295–98
Doctoral research in, 67–73
Examination:
For Master's candidacy, 65
Placement, 51

G

General Studies, College of, 144–49
Geography:
Courses, 226–30
Doctoral research in, 67–73
Geology courses, 230–32
Germanic Languages and Literatures:
Courses, 232–34
Doctoral research in, 67–73
Examinations:
For Master's candidacy, 67–73
Placement, 51
Glee Club, 160
Government Management Intern Scholarship program, 143
Government of the University, 4
Government, Business, and International Affairs, School of, 128–43
Entrance requirements, 17–18
Special programs, 143
Grades, 39
Graduate Council, 66–73
Entrance requirements, 12
Fields of research, 69–72
Graduate Record Examinations, 9, 43, 59–60, 104, 127, 131
Graduate School of Public Law, 92–95
Continuing Legal Education students, 94
Entrance requirements, 13–14
Unclassified Students, 93
Graduate study, 2–3
See also Colleges, Schools, and Divisions
Graduation:
Application for, 42
Dates
See University Calendar
Requirements, 42–44

Greek courses, 194–95
Guidance:
  Courses, 205, 287, 289, 290, 291
  Doctoral research in, 67–73
Gynecology courses, 259–60

H

Health Administration, 154–55
Health services, student, 154–55
Hebrew courses, 195
History:
  Courses, 235–39
  Doctoral research in, 67–73
  Of the University, 1–2
Home Economics:
  Associate in Science curriculum in, 57
  Bachelor of Science curriculum in, 55, 122
  Courses, 239–41
Honor Roll, Columbian College of Arts and Sciences, 49
Honor Societies, 161–62
Honors, 44
Honors List, School of Engineering, 99
Hospital Administration:
  Courses, 187–88
  Master of Business Administration field in, 139–40
Hospital, University, 5, 78–79
Hospitalization, 154–55
Hours of instruction, 84, 164
Human Resources Research Office, xlviii-li

I

Independent study plan, 59, 130
"In residence status", 21, 42
Insurance courses, 182
Intern and Resident Training, 82
International Affairs:
  Bachelor of Arts in Government curricula in, 56, 131–32
  Master of Arts in Government fields in, 137–38
  Doctoral research in, 67–73
International House, 159
International Law courses, 245, 248, 282, 284
International Relations
  SEE International Affairs

J

Journalism courses, 241–42

L

Labor courses, 182, 197, 199
Language placement examinations, 51
Language requirements, 52
Languages, Doctoral research in, 67–73
Latin courses, 194–95
Latin America, courses on, 197, 199, 237, 238, 282, 284
Latin American Civilization:
  Columbian College of Arts and Sciences major in, 58–60, 60–62
  Master of Arts field in, 63
Law:
  Courses, 242–50
  Curriculum, 91–92
  Graduate program, 92–95
  Graduate School of Public Law, 92–95
    Continuing Legal Education Students, 14, 94
    Courses, 248–50
    Entrance requirements, 13–14
    Unclassified students, 93
  National Law Center, 84–95
  Review, 89, 90 (footnote)
  School, 87–92
    Entrance requirements, 13
    Unclassified students, 13, 90
Leave of absence, 42
Liberal Arts, College of
  SEE UNDER Columbian College of Arts and Sciences
Library, 7–8
  Hours, 8, 44–45
  Law, 8, 84
  Medical, 8, 78
  Regulations, 44–45
Literatures and Languages, Doctoral research in, 67–73
Living accommodations, 157–58
Loan funds, 38
Location:
  Of the School of Medicine, 6
  Of the University, 4
Logistics Research Project (Navy), xlvi-xlviii
Lost and Found Office, 45

M

Major fields in Columbian College of Arts and Sciences, 60
Management Research Group, li–lii
Marketing courses, 183
Mathematical and Physical Sciences, Doctoral research in, 67–73
Mathematics:
  Courses, 251–54
  Doctoral research in, 67–73
Measurement Science:
  Bachelor of Science in Engineering curriculum in, 100–101, 103–4, 111–12
  Center for, 110–12
  Doctoral research in, 107–9
  Engineering Technologist Certificate in, 111
Master of Science in Engineering field in, 104–5, 105–6
Mechanical Engineering:
  Courses, 218–19
  Curriculum in, 101, 103

Medical Privileges, 154–55
Medical Sciences, Doctoral research in, 67–73
Medical Technology:
  Course, 54, 62–63, 83
  Courses, 261
Medicine:
  Courses, 255–56
  School of, 73–83
    Entrance requirements, 12
Metrology courses, 219–21
Microbiology:
  Courses, 256–58
  Doctoral research in, 67–73
Military awards, 36–37
Military honors, 44

N

National Aeronautics Space Administration Space Flight Telemetry Project, lii
National Law Center, 84–95
National Teacher Examinations, 43, 121
Navy Graduate Financial Management Program, 143
Neurology and Neurological Surgery courses, 258–59

O

Objectives, educational
  SEE UNDER Colleges, Schools, and Divisions
Obstetrics courses, 259–60
Ophthalmology courses, 260
Order of the Coif, 89
Organizations, student, 161–63
Orientation Program, School of Engineering, 97
Otolaryngology courses, 260
Outpatient Department, University Hospital, 5, 79

P

Painting:
  Courses, 174–75
  Master of Fine Arts field in, 64–65, 172
Patent Law, 91, 247, 250
Patent, Trade-Mark, and Copyright Foundation Office, 7
Patent, Trade Mark, and Copyright Law, research in, 250
Pathology courses, 260–62
Pediatrics courses, 262–63
Personnel Administration:
  Courses, 181, 182, 185, 287, 290
  Master of Arts in Government field in, 141
  Master of Business Administration field in, 141
Pharmacology:
  Courses, 263–64
  Doctoral research in, 67–73
Pharmacy:
  Courses, 264–67
  Curriculum in, 115–17
  School of, 112–17
    Entrance requirements, 16
Phi Beta Kappa, 161
Philosophy courses, 267–69
Physical Education:
  Courses:
    For men, 269–72
    For women, 272–74
  Curricula:
    For men, 55, 122–23
    For women, 55–56, 123
  Requirements, 41–42
Physical examinations, 42, 81, 154–55, 269, 272
Physical Medicine and Rehabilitation courses, 275
Physical Sciences, Doctoral research in, 67–73
Physics:
  Courses, 275–78
  Doctoral research in, 67–73
Physiology:
  Courses, 278–80
  Doctoral research in, 67–73
Placement:
  Office, 159
  Tests, 51, 97
    SEE ALSO University Calendar
Political Science:
  Courses, 280–85
  Doctoral research in, 67–73
Portuguese courses, 302
Post doctoral study, 72–73
Premedical curriculum, 12, 53–54
Prizes, 32–37
Probation:
  SEE UNDER Colleges, Schools, and Divisions
Professional organizations, 162
Property, responsibility for, 45
Psychiatry:
  Courses, 285–86
  Doctoral research in, 67–73
Psychology:
  Courses, 286–92
  Doctoral research in, 67–73
Psychometrics, Master of Business Administration option in, 141–42
Public Administration:
  Courses, 189–90
  Master of Arts in Government field in, 138
Public Affairs:
  Bachelor of Arts in Government curriculum in, 132–33
  Master of Arts in Government field in, 138
Public Law, research in, 93
Publications, student, 163

Q

Qualifying examinations, 21, 52, 59, 131
SEE ALSO in University Calendar
Quality-point index, 39–40

R

Radiology courses, 292
Reading Clinic, 149, 156–57, 200, 201, 206
Readmission, 8–9, 10
Recreation, Physical Education specialty in, 123
Refunds, 22–23
Registration, 19, 42
Regulations, 39–45
SEE ALSO UNDER Colleges, Schools, and Divisions
Religion:
Courses, 292–95
Doctoral research in the History of, 67–73
Master of Arts field in, 63–66
Religious Education, Master of Arts field in, 63–66
Religious organizations, 163
Research:
Consultants in, xxxix–xliii
Fields of, 69–72
Projects, xlvii–lii, 4
Reserve Officers Training Corps:
Air Force Unit, 18, 36–37, 40, 41–42, 44, 151–54, 168–69
Residence:
Halls, 5–6, 157–58
Requirements, 42
SEE ALSO UNDER Colleges, Schools, and Divisions
Resident Training, medical, 82
Romance Languages and Literatures:
Courses, 295–302
Doctoral research in, 67–73
Examinations:
For Master's candidacy, 65
Placement, 51
Rules of the University, right to change, 45
Russian courses, 303–4

S

Scholarship, 42
SEE ALSO UNDER Colleges, Schools and Divisions
Scholarships, 26–32
Scholastic Aptitude tests, 9, 11, 14, 51, 157
Sculpture:
Courses, 174, 175
Master of Fine Arts field in, 63–66, 172
Secretarial Studies:
Associate in Arts curriculum in, 58
Courses, 302–3
Self help, 37, 159
Semester hours:
Explanation of, 164
Maximum allowed full- and part-time students
SEE UNDER Colleges, Schools, and Divisions
Senate, University, xiv
Sigma Xi, 161
Slavic Languages and Literatures courses, 303–4
Social Sciences, Doctoral research in, 67–73
Sociology and Anthropology courses, 304–7
Sororities, 163
South America, courses on
SEE Latin America
Spanish:
Courses, 298–301
Doctoral research in, 67–73
Examinations:
For Master's candidacy, 65
Placement, 51
Special Students, Division of, 150–51
Speech:
Clinic, 157, 308, 310
Courses, 308–11
Staff of Instruction, alphabetical list, xl–xlvii
Statistics:
Business and Economic:
Bachelor's curriculum, 56–57, 135
Master's curriculum, 139
Courses, 312–16
Doctoral Research in, 67–73
Student:
Activities, 159–61
SEE ALSO Special Bulletin
Bar Association, 89
Employment, 37, 159
Life, 157–63
Organizations, 161–63
Publications, 163
Union, 158
Summer Sessions, 154
Surgery courses, 317–18
Suspension
SEE UNDER Colleges, Schools, and Divisions
Syphilology courses, 196

T

Testing Center, University, 157
Thesis, requirements for, 43
Transcripts of record, 9, 21, 41
Transfer within the University, 41
Transportation, courses on, 183–84
Trustees:
Board of, ix
Committees of the Board of, x
Tuition, 20

U

University Orchestra, 160
University Players, 160
University Students, Division of, 149–50
Urology courses, 318

V

Veterans Education, 155–56
Vocational Counseling Center, 157
Vocational curricula, 57–58

W

Warnings, 50, 100
Withdrawal, 22–23, 40, 98–99

Z

Zoology:
  Courses, 318–21
  Doctoral research in, 67–73

THE UNIVERSITY RECORD

SUMMER TERM 1961

FALL AND SPRING SEMESTERS 1961–62

DEGREES CONFERRED

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Associate in Arts

October 21, 1961

Donald B. Ardell	N.J.	Janice Lee Hink	Va.
Barbara Ann Baker	Md.	Ruth Hollands	Mich.
Joan Donell Becker	D.C.	Gordon M. Hoover	Md.
(With distinction)		Stephen Mather Kneipple	Md.
Charlotte Berger	D.C.	Barbara L. Laney	Md.
Edward Ewell Blake	Va.	Alice Marie Larkin	D.C.
Elaine Borko	Md.	Donn L. Larson	N.D.
John L. Braddock	D.C.	Miriam Dianne List	Pa.
Eva Anne Brecher	D.C.	Jeanette L'Engle Pippitt	D.C.
Shirley Lynne Carpenter	Md.	Carol Linn Pixton	D.C.
Marcy Chambers	Pa.	Lee G. Price	Md.
Elizabeth Ann Chase	Maine	Lynn Edward Reiss	D.C.
Claudia Catherine Cooper	Va.	John Nelson Rogers	Md.
Frances Bell Earle	D.C.	Rochard Dallas Smith	Kans.
William George Ellis, Jr.	Va.	Alexander Gregory Sokaris	N.Y.
Stephen Richard Enz	D.C.	Mary Sullivan	D.C.
Rosemary Ruth Franzone	Md.	Susan Louise Swan	R.I.
Frances Louise Frye	Ill.	Nancy Tucker	Md.
Johnathan Augustus Haines, Jr.	D.C.	Anne Davis Ware	D.C.
David F. Hambleton	D.C.	Barbara Alice Warrick	Md.
Robert Nelson Harvey	Va.	Peter Joseph Wasilewski, Jr.	Pa.
Charles Rufus Higginbotham, Jr.	Va.	Thomas N. J. White	Ill.
Harrie Edward Hill, Jr.	Md.	Gary Earl Williams	N.Y.

February 22, 1962

William Wesley Davis	Va.	Lawrence Jay Levine	N.Y.
Carolyn Denaro	N.Y.	Erika Lose Robinson	Va.
Sandra Kay Dunlap	Va.	(With distinction)	
Gloria Jean Eller	Va.	Catherine Ann Rochford	Va.
Richard Joel Ellman	N.Y.	Marshall Roosevelt Snead	Va.
Evelyn Ernest	D.C.	Patricia Coles Steele	Va.
Arlene Linda Glugatch	N.Y.	Donald Tobin Stem	Fla.
Suzanne Foulke Judge	Md.	Harriette Bette Steine	Md.
Bernard Howard Kirshbaum	D.C.	Andrew Stephen Unger	N.Y.
Arthur Lester Lappen	Mass.	William Gover Williams III	D.C.
Darwyn Hall Lesh	Va.	Jane Berger Wolpoff	Va.

June 6, 1962

Robert Ames Alden	Va.	Arthur Sinton Locke, Jr.	Va.
Eva B. Antoniou	D.C.	Harold LeRoy Martin	Md.
Barbara Linda Beccles	D.C.	Robert Francis McMahon	Va.
Helen LeDuc Bishop	Md.	Paula Mae Olin	Va.
Lola Burns	D.C.	(With distinction)	
Lawrence Bampfylde Cohn	Va.	Ellen Ottenheimer	Md.
Nancy Louise Crummins	D.C.	Margaret Bratton Powell	Va.
Bruno John Darrow, Jr.	D.C.	Donald Edgar Press	Va.
Joseph Deutsch	N.Y.	Theodore Webster Radin	Va.
Neale Gary Dobkin	Conn.	Maxine Joyce Richter	Va.
Barry Lance Duman	N.Y.	Joel Rosenberg	N.J.
Marilyn June Evans	D.C.	William B. Rosenberg	N.Y.
(With distinction)		Eva Michael Rubin	N.J.
Eric Michael Fine	Md.	Faye R. Rubin	D.C.
William Erwin Fredenberger, Jr.	D.C.	Ira David Schandler	N.Y.
Thomas Hughes Fulcher, Jr.	D.C.	Sandra Lynn Schwartz	Calif.
Stanton Jay Gildenhorn	D.C.	Marie Louise Seltzer	D.C.
Herbert Hopkins Haywood	Md.	Edwena Marguerite Shelford	D.C.
Russell Charles Huffman	Va.	Wendy Joyce Somers	Md.
Carey Ingram	Ga.	Morris John Sutter	N.J.
Marsha Harriet Jontiff	D.C.	Marie Ann Tumeo	N.Y.
Helen Kurtz	Md.	Patricia Anne Walker	D.C.
Charles Anthony Lally, Jr.	D.C.	Nancy Wathen	Md.
Alice Sarah Linde	Va.	Olga L. Wilson	Va.
Charmaine Lusée	Md.		

Associate in Science

October 21, 1961

Mandalene Swindell Marshall — Va.

Bachelor of Arts

October 21, 1961

George Benton Beach, Jr.	Va.	Iris G. Mensh
Fred Clifton Berry, Jr.	Ill.	William Bateman Moore
Kenneth Stanley Burke	Md.	Howard Warfield Myers
Michael John Clark	Pa.	Peter H. Patterdee
Joan Hull Colbert	D.C.	Virginia Annette Pitts
Richard Warren Eisenhower	Va.	Stella Janie Pridgen
Michael Meigs Feakins	Pa	George O. Stapleton
Lawrence E. Forey II	D.C.	Charles E. Stirling
Mary Patricia Gallagher	D.C.	Neal Ray Sumner, Jr
Cheryl Lee Green	Md.	Judy Ellen Vanness
Lucinda Ann Hanna	D.C.	Elizabeth Barbara Warner
Elizabeth Flower Hogen	D.C.	Richard W. Weller
George Madison Lady	D.C.	Bruce Carroll Whitener

February 22, 1962

Wendell Lloyd Adkins, Jr.	Va.	Sharon Karr Jaffee
Philip Samuel Amsterdam	N.J.	Loren Leon Leeper, Jr.
May Paulette Arevopoulos	D.C.	Siri-Anne Gudrun Lindberg
Madelene Ann Baker	Mich.	Ronald Edward Loughrey
Carol Miller Balbes	D.C.	Robert Childs Macdonald
Diana Bancker	Va.	Julie Ann Marsh
Ruth Patrick Craxton Berner	Va.	Diana Whitley McKinney
Mary Ann Gastineau Booher	Va.	Dorothea Sophie Michelman
Denise Francis Byrne	Va.	Helen Bovard Montague
Sandra Lee Carr	Va.	Guiseppe Morra
Upton John Christian	Md.	Martha Louise Mueller
Judith Shirley Cohen	Conn.	Robert Francis O'Connor
Loretta Lynn D'Andre	N.J.	James Harold Olsen
Sue Hyde Dodge	Va.	Patricia Hubbard Parks
Peter Ewa	D.C.	Mary Parsons Perkins
Priscilla Dawes Eure	Va.	Gloria Liebner Phillips
Judith Wilson Gordon	Va.	Marcia Diane Porterfield
Marie L. Grekoff	Calif.	Caroline Dennis Prade
George Joseph Hannon, Jr.	D.C.	Carol Jean Rodeffer
James Lachney Harris	D.C.	Marcus Crown Russell, Jr
Richard Harvey	Md.	Courtney Dorian Schlosser
Sandra Dale Hobbs	D.C.	Virginia Thomas Shackelford
Linda Claster Hochman	Va.	Raoul Pingree Smith
John Barmer Hoeg	Miss.	Alice Ward Sobotka
Elizabeth Allen Holmes	D.C.	Timothy Otis Temple
(With distinction—Special honors in Religion)		Donna Barbara Truntich
Lowa Grace Holton	Kans.	Anderson Wallace, Jr
Mildred Booth Hood	D.C.	Robert C. K. Wei
Carl Dewey Hopkins, Jr.	Md.	Stewart John Westdal
Joyce Cecelia Horton	D.C.	Judith Lee White
George Percival Hunter, Jr.	Va.	John Helga Williams, Jr.
Merriam Jeannette Jacobsen	Wis.	(With distinction)

June 6, 1962

Leslie Abramowitz	Md.	Anthony David Blau
Rosalie Ann Ackerman	Md.	Eleanor Harrison Boothe
Edward Greenwood Alexander, Jr.	D.C.	William Avis Boothe
Katharine duPont Andrews	Va.	Glenn Houghton Borders
Alan Joseph Avery	Va.	Helen Strickland Bothwell
John David Bachman	Md.	(With distinction)
Bertram Jay Bansil	D.C.	John Foster Bruce
(With distinction)		John Emmett Buckley
Barbara Ann Beall	Md.	Thelma Kanatzar Burkhalter
(With distinction)		Dorothy Jeanne Carlson
Beverly Anne Beers	Va.	(With distinction)
Shirley Kendrick Bennett	Md.	Barbara Sue Carter
James Roger Black	D.C.	

Elizabeth F. Clarkson — Va.
(With distinction)
June Marie Coder — Ohio
Claudia Catherine Cooper — Va.
William Jon Costanzo — Pa.
Terence Joseph Costello — Hawaii
Katharine Barnwell Crawford — S.C.
Ray Frederick Crist — D.C.
Elaine Frances Cronin — Mass.
Patricia Barr Crowe — Va.
Susan Elise Cunningham — Va.
Isabel Merrick Davies — D.C.
(Special honors in History)
Sandra Kay Dunlap
Emmett Charles Dye, Jr. — Va.
Bonnie Loretta Edmonds — Va.
Claude Wayne Elliott — Va.
John Howard Ellis — D.C.
Barbara Zell Epstein — Fla.
Jon Allen Feldman — D.C.
Lilien Filipovitch — N.J.
(With distinction)
Gloria Esther Finkelstein — D.C.
Alison Wilcox Fletcher — D.C.
Frieda Van Harreveld Ford — Ohio
David Fouquet — D.C.
Lucy Virginia Fusco — Md.
Tolise Kirkpatrick Gathings — N.Y.
Thoma Ann Gebringer — Ark.
Sandra Agnew Goldberg — Md.
Michael Thomas Gosman — D.C.
Barry Kenneth Gould — Md.
William Allen Graham — D.C.
Fred Harvey Grant — Va.
William Taliaferro Grier — N.Y.
Anita C. Hall — Va.
Marjorie Myers Halpin — Md.
John Henry Hann — Va.
(With distinction)
Linda Anne Heller — D.C.
Adelia Ogden Heller
Jane Elizabeth Heller — D.C.
Peter Hemingway — D.C.
Deborah Anne Hirst — Pa.
Stephen August Hoenack — Md.
Robert William Hopkins II — Va.
Robert Curtis Howard — Md.
Ann Hightower Hughes — Ohio
Anne Dudley Jones — Va.
Jeanne Margaret Joyce — D.C.
Michael Kachmar, Jr. — D.C.
Shailaja S. Kalelkar — D.C.
Barry Irwin Kanter — India
Kay Jean Kazlow — Mass.
Claire Gerard Kelcher — Pa.
Martha Jo Kell — D.C.
Patricia Clare Kerman — Ga.
Sonjina Lee Kett — N.Y.
Andrew Hok-Chung Koo — Pa
Brownie Lee Koonen — China
Barbara Louise Laney — Md.
Janice Louise Larkins — Md.
Lester Alan Lebel — Va.
Robert Stephen Levine — N.Y.
Robert Steven Lapman — N.Y.
Sam P. Lockard — Calif.
Matsa C. Manos — W.Va.
Erica Markwood — Greece
Jo Anne Mason — D.C.
Terry Ann Mason — Md.
B. Katy Matson — Va.
Judith McConnell — Md.
Nancy Mae McDonald — Va.
Jane McLain — D.C.
Phyllis Smith McLeod — Del.
Maureen Lynn McManus — Va.
Joan Katherine McWilliams — Md.
Peter David Mechanick — Md.
Patrick H. Mechem — N.J.
Lorraine Rochelle Meyerovitch — Calif.
Carolyn Johnson Middleton — Md.
— Md.

Rhoda Baynard Miller — D.C.
(With distinction)
Irene Marie Moore — D.C.
Gerald Gamba Morris — Va.
Ernest Cleveland Moser — Va.
Kay Ruth Ruhvard Muench — D.C.
Nancy Davis Myers — Md.
Margaret Ellen Neff — Fla.
Jean McInnis Nicolai — Va.
Helen Vincenza Nitti — Va.
John Arthur Nolte — Md.
Joyce Judson Ormsbee — N.Y.
(With distinction—Special honors in English)
Lydia Jane Pallme — N.Y.
Ada Margaret Palmer — Kans.
Karen M. Parker — D.C.
Phyllis Ann Parzuale — Mass.
Elizabeth Benedict Peabody — Ohio
Barbara Ann Pearsall — Va.
Kenneth Gary Perry — Calif.
Sally Sharrett Perryman — Va.
Ruzica Popovatch — D.C.
John Musante Porter — Va.
Judith Hesse Posner — D.C.
Stephen John Pulaski — Mass.
Wanda H. Rappaport — Va.
(With distinction)
Martin Vester Reere — D.C.
(With distinction)
Elizabeth Ann Reed — D.C.
Brenda Death Reiskin — Md.
Darryl Denna Rekemeyer — Md.
Jeremy William Reynolds — Va.
Thomas Leroy Ringley — Wyo.
Victoria Scott Riordan — Va.
(With distinction)
Richard Vernon Runge — Va.
Edward Baxter Rusin — N.Y.
Celia M. Ruth — Va.
Phyllis Kershaw Sapienza — D.C.
(With distinction)
Elizabeth Machin Sarros — Oreg.
Nancy Jean Schafhauser — Md.
Garland Rudder Schweickhardt — Va.
Jonathan Albert Scull — Va.
Margaret Rose Sennett — Pa.
Edward Joseph Shahen, Jr. — Md.
Bonnie Schwartzbach Sherman — Md.
Anita Dates Sherven — D.C.
Laura Jane Shouse — Va.
Earl Richard Smith — Va.
LL.B. 1942, Columbus University
Stanley Sherrel Smith — D.C.
Peter Ruediger Sommer — D.C.
Erma Jean Stabal — Md.
Charles Trowbridge Stanley — Md.
Barbara Roesch Sullivan — Md.
G. Jacqueline Swain — N.Y.
Sandra Jean Swain — Va.
Charles Wesley Swisher — D.C.
Fuchsoch Thomas — Va.
Isabel Brooke Thomasson — D.C.
Paula Jean Tyler — Va.
Georgia Anna Vanden — D.C.
Lynda Rotherham Van Nort — Ohio
Florence Jeanine Waddell — S.D.
Marvin Mitchell Waldman — D.C.
Sally Rebecca Wallace — Va.
Donna Lee Walther — Md.
Barbara Anne Ward — Va.
William Budd Warden — W.Va.
Charles Thomas Weaver — Ala.
Hazel Lorriewen Whitaker — Md.
Thomas Nicholas White — Ill.
John Allen Whiting — Vt.
Julie Avery Williams — D.C.
Ruth Dee Wintery — Va.
Elizabeth F. Wiseman — Md.
Barbara Louise Wohl — Va.
Dexter Alvin Wold — Calif.

Bachelor of Science

October 21, 1961

Lamia Al-Arif — Iraq
James Morrill Bridgman — Conn.
Joseph Morton Iseman — D.C.
Andrew Simeon Stancioff
Joseph Michael Zurlo, Jr.

February 22, 1962

Martha Magdalene Fisher — D.C.
James Loyce Swindal — Va.
Peter Joseph Wasilewski

June 6, 1962

William Paxson Chalfant III — Md.
Alfred Francis Dibba — D.C.
Bracha Edgar — D.C.
John McHenry Garrison — Va.
Stephen Frank Gordon — N.J.
John Gregory — D.C.
(With distinction)
Rosalie Joyce Gutride — D.C.
Roy Woodrow Harding, Jr. — Md.
William Downey Hardy, Jr. — N.J.
Arnost Heidrich — D.C.
(With distinction—Special honors in Mathematics)
Michael Roy Herron — Ind.
Daniel Higman — D.C.
Robert Herndon Johnstone — D.C.
Kira Kalvik — D.C.
John Lavagnino
Ralph Isaac Lipman
Gary Thomas McIlroy
Stanley Irving Munn
Stephen Jerome Newman
(With distinction)
John Alford Parker, Jr.
William B. Reese
Gary L. Roffman
James Alan Shneer
(With distinction)
Frederick Wilson Smith, J.
Giles Henry Spaid
(With distinction)
Joyce Stichman
Kenneth Bruce Weiner
Pamela Carnahan Woodford

Bachelor of Science in Medical Technology

October 21, 1961

Katherine Herckner Cone — N.J.
Gail Rogers

February 22, 1962

Wilma Jane Berlin — Va.

Master of Arts

October 21, 1961

Carolyn Lenore Custer — Pa.
A.B. 1960, The George Washington University
Elizabeth Beasley Del Donna — D.C.
A.B. 1961, The George Washington University
Francisco de Legarreta — N.Y.
B.S. in F.S. 1951, Georgetown University
Harold James Dupuy — Va.
A.B. 1950, The George Washington University
Eugene Jay Finkel — D.C.
A.B. 1952, Swarthmore College
Mary Ellen Forbes — N.J.
A.B. 1959, Mary Washington College
John Dryden Kazar, Jr. — Va.
A.B. 1950, Tufts University
John Eichholtz Kramer, Jr. — Pa.
A.B. 1956, Dartmouth College
Deane Richard Lycan
B.S. 1956, University of Idaho
Barbara Nelson Mullens
A.B. 1942, University of Wyoming
Maria Opasnov
A.B. 1952, Wellesley College
Robert David Popper
A.B. 1959, The George Washington University
Mary McNeil Rhodes
A.B. 1959, The George Washington University
Gordon Frederick Shea
A.B. 1950, Syracuse University
Jackwell Susman
B.S. 1952, University of Pittsburgh
Donald Augustus Swicord, Jr.
A.B. 1958, The George Washington University

February 22, 1962

Helen Ruth Ackerman — N.Y.
A.B. 1960, Hofstra College
Lawrence Larsen Ames — Va.
A.B. 1950, The George Washington University
Sally Ann Bele — D.C.
A.B. 1959, The George Washington University
Sanford Alan Berman
B.S. in B.A. 1958, American University
Barbara Longway Briggs
A.B. 1946, University of Michigan
Hana Bruml
A.B. 1961, The George Washington University
Richard Lynn Carroll
A.B. 1960, The George Washington University

Paiboon Chuangchid — Thailand
B.E. 1960, Thammasat University

Salvatore Michael Clarizio — Conn.
A.B. 1958, Catholic University of America

Marilyn Ruth Cohen — Md.
A.B. 1957, University of Maryland

Elena Talcott Constantinople — D.C.
A.B. 1958, Bryn Mawr College

Robert Lee Farrell — Va.
B.S. 1957, Purdue University

Geraldine Agnes Graham — D.C.
A.B. 1959, The George Washington University

Beatrice Hauer — Va.
A.B. 1960, Ursinus College

James Robert Kirby, Jr. — Md.
B.S. 1959, D. C. Teachers College

Sharon Lynn Kirk — Md.
A.B. 1958, Monmouth College

Mary Elshoff Arenas — D.C.
A.B. 1959, Rockford College

Miles Morton Clark — Calif.
A.B. 1943, Macalester College

Henry Bartholomew Cox — D.C.
A.B. 1959, Princeton University

Marcia Bartko Creswell — Md.
A.B. 1958, The George Washington University

Ruth Priest Dixon — Va.
A.B. 1942, Texas Christian University
A.B. 1960, The George Washington University

Mary Catherine Elward — Md.
A.B. 1953, Trinity College

Marvin Thomas Ely — W.Va.
A.B. in Ed. 1956, The George Washington University

Fanchon Chaffee Gerstenberg — Md.
A.B. 1959, Stanford University

Anne Juliet Gibert — Va.
A.B. 1959, The George Washington University

David MacMahan Hodge — Va.
B.S. 1949, Georgetown University

David Ernest Prowse Johnson — Ill.
A.B. 1960, Wheaton College

Ruth Doris Koidan — D.C.
A.B. 1954, B.S. 1958, The George Washington University

Marlyn W. Korin — D.C.
A.B. 1955, Stanford University

David Herbert Otis Lawson — D.C.
A.B. 1958, Dartmouth College

Timothy Dean Mead — Mich.
A.B. 1960, The George Washington University

Harriette Janet Ralston — D.C.
A.B. 1956, Butler University

Carl Steiner — Va.
A.B. in Ed. 1958, The George Washington University

Joseph Benjamin Thornton, Jr. — D.C.
B.S. 1953, D. C. Teachers College

Samuel Trachin, Jr. — D.C.
A.B. 1960, The George Washington University

Evelyn Huffman Viehman — Va.
A.B. 1943, University of Illinois

Tsing Yuan — D.C.
A.B. 1960, The George Washington University

Nicholas John Zentos — Ohio
A.B. 1959, University of Toledo

June 6, 1962

James Vivien Lomax, Jr. — Pa.
B.S. 1956, University of Pittsburgh

Leo Thomas Mills — Ohio
A.B. 1953, Ohio University

Ann McFarling Milne — Calif.
A.B. 1960, University of California

Beatriz Feliciano Mohler — D.C.
A.B. 1958, The George Washington University

Stephen Charles Mohler — Va.
A.B. in Ed. 1959, The George Washington University

Richard Lloyd Muse — N.C.
A.B. 1954, Wake Forest College
B.D. 1958, Southeastern Baptist Theological Seminary

Charlotte Anne Newton — D.C.
A.B. 1954, Guilford College

Maria d'Lourdes Gomez Ortega — D.C.
A.B. 1960, The George Washington University

Widson Cooper Pittman — D.C.
A.B. 1953, Harvard University

Orville H. Schmidt — D.C.
A.B. 1956, University of Minnesota

Mya Saw Shin — Burma
A.B. 1952, B.L. 1955, University of Rangoon

Burton William Stephens — Md.
A.B. 1958, American University

Michael Jay Watkin — D.C.
A.B. 1960, The George Washington University

Byron LeRoy Witt — Md.
A.B. 1959, Rutgers University

Master of Science

October 21, 1961

Bernard Beer — Md.
B.S. 1956, Brooklyn College

Aurea R. Cabré-Lopez — Puerto Rico
B.S. 1957, University of Puerto Rico

Elsa Rodríguez de Cestero — Puerto Rico
B.S. 1935, University of Puerto Rico

John Duncan Gassaway — D.C.
B.S. 1956, Georgetown University

Fentress Rhodes, Jr. — Va.
B.S. 1956, Georgia Institute of Technology

February 22, 1962

Jacob Nathan Eisen — Md
A.B. 1950, Brooklyn College

Mahmoud Khairat Ahmed Khairat — United Arab Republic
B.S. 1958, A'In Shams University

John Campbell Laudon — Md.
A.B. 1959, Alfred University

Joseph Robert Molz — Md.
B.S. 1957, Franklin and Marshall College

William Angus Muir — D.C.
B.S. 1962, The George Washington University

Stanley Nesheim — N.Y.
B.S. 1956, Brooklyn College

Maya Paabo — D.C.
B.S. 1956, The George Washington University

George Lee Southard — Va.
B.S. 1959, Virginia Military Institute

June 6, 1962

Johnnie Manuel Albizo — Va.
B.S. in Ed. 1956, Northeastern State College

Julia Ana Bustelo-Garriga — Puerto Rico
B.S. 1958, University of Puerto Rico

Louis McDuffy Cameron — D.C.
B.S. 1957, University of Richmond

Virginia Anne Childs — Md.
A.B. 1959, Connecticut College

Arthur Mason DuPré III — D.C.
B.S. 1959, Wofford College

Janet Smith Eyler — Md.
B.S. 1949, University of Rhode Island

Ai Chun Fang — Md.
B.S. 1944, National Sun Yat-Sen University, China

Carla Gretchen Harms — Md.
B.S. 1959, University of Maryland

Sin Ai Hyun — Korea
B.S. in Phar. 1959, National University, Korea

Panalee Thomson Ikari
A.B. 1943, University of Southern California

Harry Lee Jones
B.S., A.B. 1958, University of Texas

Miles Harold Letts
B.S.E. 1954, University of Michigan

George Joseph Peckham
B.S. 1961, Manhattan College

Maurice Pressman
B.S. 1938, Worcester Polytechnic Institute

Azra Qureshi
M.B.B.S. 1949, King Edward Medical College, Pakistan

Charles Ernest Rossi
A.B. 1958, Harvard University

William George Setser
A.B. 1954, Colby College

Geoffrey Unio Uyehara
A.B. 1955, The George Washington University

Master of Fine Arts

June 6, 1962

Sonia Marie Crafton — D.C.
B.F.A. 1953, Temple University

George Albert Hawks — Md.
A.B. 1960, The George Washington University

Maliheh Afnan Mahhouk
A.B. 1955, American University of Beirut, Lebanon

Douglas H. Teller
A.B. 1956, Western Michigan College

THE SCHOOL OF MEDICINE

Doctor of Medicine

June 6, 1962

George Robert Allen — Idaho
B.S. 1958, College of Idaho

Kathryn Ann Anderson — D.C.

Herman Barton Applebaum — N.Y.
(With distinction)
A.B. 1958, Dartmouth College

Donna Jane Asmont — Calif.

Lee Archer Asmont — Calif.
A.B. 1955, Pacific Union College

James L. Barrett — Mass.

Grover William Bedeau, Jr. — Calif.
A.B. 1958, College of the Pacific

Clyde Laurence Bell, Jr. — Md.

Benne Gene Bendler — Ind.
B.S. 1956, Roosevelt University

Michael Edward Bohan — Del.
A.B. 1958, LaSalle College

Carol Rittenhouse Brie — Va.
B.S. 1958, University of Richmond

Alfred William Brunt, Jr. — Idaho

George Franklin Buerger, Jr. — Pa.
B.S. in Phar. 1957, University of Pittsburgh

Michael Frank Buscemi — N.J.
B.S. 1957, Georgetown University

Terry Muckley Buxton — Idaho
B.S. 1959, University of Utah

William Daxton Carrell, Jr. — Ariz.
A.B. 1957, Stanford University

Joyce Ann Ong Chin — Calif.
A.B. 1958, University of California

Melvin Perry Chodosh — Conn.
B.S. 1959, University of Pittsburgh

Peter Lloyd Crandall — Calif.
A.B. 1958, San Jose State College

Ronald Francis Crown — Md.
B.S. 1958, American University

Sidney Leon Eisenbaum
(With distinction)
A.B. 1958, Tulane University

Michael Roy Fogel
(With distinction)
A.B. 1958, Haverford College

Charles Whitfield Griffiths

Harold Mayne Griffiths

Vincent Livingston Guandolo
A.B. 1953, Kenyon College

Hubert Maury Gulak
B.S. 1958, Duquesne University

Byron Charles Gwinn II
A.B. 1955, Duke University

Jeanne Anne Hanache
A.B. 1958, College of New Rochelle

Leland Forest Haney
B.S. 1958, University of Idaho

Robert Michael Henderson
A.B. 1959, University of Arizona

Talmage Gordon Hiebert
A.B. 1950, University of Kansas
A.M. 1954, Ph.D. 1956, The George Washington University

Barton Hoexter
A.B. 1958, Kenyon College

Michael G. Hoffman

Arthur Curtis Hurt III
A.B. 1958, Stanford University

Richard Hudson Huster
A.B. 1958, Duke University

Mary Marcell Jackson
A.B. 1950, Montana State University

Edward A. Janon
(With distinction)
A.B. 1958, University of Pennsylvania

James Joseph Jardee — Oreg.
B.S. 1960, University of Portland
Lawrence Alan Jones
John Alexander Kachmarick, Jr. — Va.
Allen Lloyd Kauffman — Pa.
B.S. 1958, Wagner Lutheran College
Jack Earl Kundin — Va.
With distinction)
John Marc Lanham — N.J.
B.S. 1952, College of Idaho
Francis Gerald LaPiana — Idaho
Francis Marion Leake — Ill.
A.B. 1958, University of California at Los Angeles — Calif.
Frederick Byron Liebler
B.S. 1958, University of Pittsburgh — Pa.
George Andrew Liebler
B.S. 1958, University of Pittsburgh — Pa.
Floyd D. Loop
B.S. 1958, Purdue University — Ind.
William Robert Loscher
B.S. 1958, Washington State University — Calif.
William McKenzie Lundie
A.B. 1958, New York University — N.Y.
David George Luthringer
A.B. 1958, Princeton University — Md.
John Housden Lane Marshall
B.S. 1958, University of Maryland — D.C.
John Keith Mason
B.S. 1954, Rocky Mountain College — Mont.
Joseph Anthony Matan
Preston Brooks Mayson, Jr. — Md.
B.S. 1955, U. S. Military Academy — S.C.
Jo Kent McBeath
B.S. 1957, Idaho State College — Nev.
James Edward McCreedy
B.S. 1958, Westminster College, Pa. — Pa.
Assadullah Meymandi-Nejad
Joseph Nicholas Miuale — Iran
B.S. 1957, Rutgers University — N.J.
Isidore Mihalakis
B.S. 1958, Moravian College — Pa.
Robert Henry Morrell
B.S. 1958, University of Oregon — Idaho
Ronald Eugene Mullen
A.B. 1956, Marion College — Ill.
B.D. 1956, Northern Baptist Theological Seminary
Manfred R. Nelson
Richard George Nickerson — Wyo.
A.B. 1958, New York University — N.Y.
Darrell K. Oberg
A.B. 1958, University of Pennsylvania — N.J.
Kevin Daniel O'Brien — Mass.
A.B. 1958, Boston College

Donald Francis O'Malley — Pa.
B.S. 1959, University of Pittsburgh
Richard E. Ostler — Idaho
B.S. in Phar. 1960, Idaho State College
Joseph Charles Patti — N.J.
A.B. 1958, Rutgers University
David Noel Peterson — D.C.
B.S. 1958, Brigham Young University
Alfred Karl Pfister — W.Va.
A.B. 1958, Washington and Jefferson College
David Leon Raphling — D.C.
A.B. 1959, The George Washington University
David Kay Ricks — Idaho
Richard Trelle Roberge — Md.
B.S. 1958, University of Idaho
Bobbie Lee Roberts — Va.
Herman Lloyd Rundle — Calif.
A.B. 1958, University of California at Los Angeles
Kenneth Seeman — N.Y.
A.B. 1958, Franklin and Marshall College
Lawrence John Severino — N.Y.
A.B. 1958, Cornell University
Frank Chadwick Sheldon — N.J.
A.B. 1958, Rutgers University
Harris David Shafrin — Md.
(With distinction)
B.S. 1958, The George Washington University
Robert Vigh Smith — Calif
Adam Sommerstein — Pa.
B.S. 1958, University of Pittsburgh
James Andrew Sterling — Md.
A.B. 1958, Williams College
Alfredo Timoteo Suescum — Panama
Vernon Lynn Swenson — Utah
With distinction)
Lowell Martin Weiss — N.J.
(With distinction)
B.S. 1957, Rutgers University
Edward Gale Whiting, Jr. — Calif.
A.B. 1956, Stanford University
Thomas Russell Whyte — D.C.
B.S. 1958, The George Washington University
Elliot Charles Wilner — D.C.
A.B. 1958, Columbia University
George Lee Wing — Mass.
A.B. 1958, Harvard University
George John Wolcott — Nebr.
A.B. 1958, Dartmouth College
Lawrence Linden Young — Ohio
A.B. 1958, Stanford University
Stanley Burkle Young — Ind.
B.S. 1958, Purdue University

THE LAW SCHOOL

Bachelor of Laws

October 21, 1961

Claude Leo Beaudoin — Md.
B.S. 1956, University of New Hampshire
Robert Ellis Best — Va.
B.B.A. 1954, University of Oklahoma
Samuel Herman Blech
B.S. 1950, Brooklyn College — Md.
Jack Lee Bohan
B.Met.E. 1956, Rensselaer Polytechnic Institute — Va.
Stewart Dawson Burton
A.B. 1951, Brigham Young University — Utah
Robert Allen Cahill
B.S. in E.E. 1956, University of Wisconsin — Wis.
Donald Eugene Campbell
A.B. 1959, The George Washington University — Colo.

Edgar Ronald Coffman — Va.
B.S. in M.E. 1948, University of Michigan
Rodger Duane Collons — Va.
B.S. in C.E. 1957, University of Texas
George Edward Cranwell — N.J.
B.S. 1954, Saint Peter's College
Lewis McClellan Dalgarn — Va.
B.E.E. 1957, Vanderbilt University
Hector Davila-Roman — Puerto Rico
A.B. 1956, Inter-American University of Puerto Rico
Mauricio Furio De Martino — D.C.
A.B. 1958, The George Washington University
Robert Abel Dennison, Jr. — Va.
B.C.E. 1948, Rensselaer Polytechnic Institute

James Frederick Doak — Okla.
A.B. 1956, University of Kansas

Joseph Franklin Dugan — N.J.
A.B. 1957, Pennsylvania State University

George Cordell Easter — Mass.
A.B. 1956, Princeton University

Alfred Paul Ewert — Va.
B.S. in E.E. 1955, University of Michigan

Vincent James Femia — Md.
A.B. 1959, The George Washington University

Edmund Eugene Fleming — Iowa
B.S. in F.S. 1959, Georgetown University

Bernard S. Gild — D.C.
B.B.A. 1957, University of Pittsburgh

Morton Norman Goldstein — D.C.
A.B. 1957, University of Maryland

James Edward Harvey, Jr. — Fla.
B.M.E. 1940, Tulane University
M.B.A. 1948, Harvard University

James Edmond Hawes — D.C.
B.S. in E.E. 1957, University of Illinois

William H. Holt — Va.
B.S. in Engr. 1957, The George Washington University

Carter Carol Hubbel, Jr. — Md.
A.B. 1959, University of Maryland

James Roxier Hulen, Sr. — Va.
B.S. in M.E. 1958, University of Missouri

Herbert Kenneth Hyde, Jr. — Okla.
A.B. 1955, University of Oklahoma

Peter Isakov — Ohio
B.Ch.E. 1958, University of Cincinnati

Vernon Webster Johnson, Jr. — Md.
A.B. 1956, Duke University

John Tyden Ketcham — Va.
A.B. in Govt. 1958, The George Washington University

John Arthur Koch — D.C.
B.I.E. 1954, Ohio State University

John Frederick Kovin — Md.
A.B. 1958, Washington Missionary College

Anthony Thomas Lane — Va.
B.E.E. 1957, The George Washington University

Stuart Lubitz — Mich.
B.I.E. 1957, B.M.E. 1958, University of Florida

John Raymond Manning — Iowa
B.S. in Engr. 1957, The George Washington University

James Francis McCarthy — Mass.
A.B. 1956, Boston University

John Joseph McCormack — Mass.
B.S. 1954, Boston College

John R. Nordstrom — N.D.
A.B. 1949, Minnesota State College, Moorhead
A.M. 1958, University of Minnesota

Edward William Nypaver — D.C.
B.S. in C.E. 1957, University of Pittsburgh

Dennis Edward Watson O'Connor — Hawaii
B.S. 1952, U. S. Naval Academy

Gordon Harold Olson — Va.
B.S. 1955, North Dakota State University

Alan Gilbert Paul — Va.
B.M.E. 1956, Rensselaer Polytechnic Institute

John Joseph Posta, Jr. — D.C.
B.S. in Engr. 1957, The George Washington University

Warren Estes Ray — Va.
B.S. in E.E. 1952, M.S. in E.E. 1956, Oklahoma State University

Ronald William Reagin — Va.
B.S. 1958, University of Missouri

Wayland Henry Riggins — Md.
B.S. 1956, Clemson Agricultural College

Robert H. Russ — Va.
A.B. 1956, The George Washington University

Donald Watern Seiler, Jr. — Md.
A.B. 1956, College of William and Mary

Edward Lawrence Sherman — Md.
A.B. 1951, A.M. 1953, Roosevelt University

Donald James Singer — Mo.
B.S. in Ch.E. 1956, Michigan State University of Agriculture and Applied Science

Daniel Warren Sixbey — D.C.
A.B. 1954, University of Maryland

Marvin Snyder — Md.
B.E.E. 1954, Cornell University

George Vande Sande — N.J.
B.S. in E.E. 1948, University of Michigan

Roger Alan Van Kirk — N.Y.
B.S. in E.E. 1957, University of Vermont

Alan David Wolfe — N.Y.
B.S. 1952, Queens College
M.S. 1956, Massachusetts Institute of Technology

James Creighton Wray — Md.
B.M.E. 1958, Villanova University

Francis Kopp Zugel — Md.
B.S. in Eng. 1957, The George Washington University

February 22, 1962

James Leighton Bean — Ind.
B.S. in C.E. 1950, Tennessee Polytechnic Institute

Daniel Corwin Block — Va.
B.S. 1957, Texas College of Arts and Industries

Carmen Joseph Blondin — N.J.
B.S. 1955, U. S. Coast Guard Academy

Reno Elwood Bonfanti — Pa.
A.B. 1953, University of Pittsburgh

Donald Marvin Caplan — Md.
B.S. 1954, University of Maryland

Josiah William Collins II — Ill.
B.S. 1955, U. S. Naval Academy

Richard Edward Constant — N.Y.
B.S. in E.E. 1959, University of Colorado

Roger Joseph Costello — Va.
A.B. 1948, University of Cincinnati
M.B.A. 1951, Harvard University

Samuel Parkinson Cowley, Jr. — Utah
B.S. 1959, University of Utah

Barry Shields Cramp — N.J.
A.B. 1958, Colgate University

John Preston Creer III — Utah
B.S. 1957, University of Utah

Donald James Ellingsberg — Md.
B.S. 1955, North Dakota Agricultural College

Edward Francis Gaulin — Maine
B.S. 1959, Georgetown University

Donald Edward Gillespie — Va.
B.S. 1955, Virginia Military Institute

Paul Richard Harder — Md.
B.S. 1957, Rose Polytechnic Institute

Thomas Joseph Harrigan — Va.
A.B. in Govt. 1959, The George Washington University

Leah Kirstina Hendriksen — D.C.
B.S. in Ed. 1932, M.S. 1933, University of Michigan
A.M. 1936, Columbia University

Corwin Ray Horton — Ore.
B.S. 1956, Oregon State College

Gary Lynn Jordan — Kans.
B.S. in Ch.E. 1958, University of Kansas

Donald Allen Kaul — Md.
B.M.E. 1958, Ohio State University

Samuel William Keller — Va.
B.S. 1955, University of Maryland

Helen Scrymgeour Lane — Va.
A.B. 1928, University of Michigan

Betty Jayne Latshaw — Ohio
B.B.A. 1959, University of Oklahoma

David Ellis Leslie — Calif.
B.S. 1957, California State Polytechnic College

Floyd Stern Levison — Va.
B.S. 1957, U. S. Merchant Marine Academy

Dana Bradford Malone — Mass.
A.B. 1938, Harvard University

Charles Taylor Manatt — Iowa
B.S. 1958, Iowa State University

Melvin Edward Marmer — Md.
B.S. in Ed. 1955, M.B.A. 1957, University of Maryland

George Francis Mautz — Pa.
B.C.E. 1957, Villanova University

Michael Nicholas Meller — Va.
B.Ch.E. 1957, Pratt Institute

George Gordon Mullins — Va.
A.B. 1943, Hamline University

David Verne Munnis — D.C.
B.S. in Ch.E. 1959, University of Illinois

William Lynn Nixon — Idaho
B.S. 1958, Brigham Young University

Julia Jean Norrell — Ark.
A.B. 1957, Ohio Wesleyan University

Gabriel Phillips — Md.
B.S. 1956, University of Maryland

Allan Rudolph Plumley, Jr. — Va.
A.B. in Govt. 1959, The George Washington University

Vincent Lawrence Ramik — Va.
B.S. 1957, Pennsylvania State University

Joseph Niel Renner — Calif.
B.S. 1935, University of Oregon

Mark Rollinson — Va.
A.B. 1954, Duke University

William Alexander Scott — D.C.
A.B. 1955, Johns Hopkins University

Richard Reynolds Seideman — Va.
A.B. 1955, Pennsylvania State University

Leonard Sandor Selman — N.Y.
B.S. in Eng. 1958, University of Connecticut

Ralf H. A. O. Siegemund — Va.
Diplom Geophysiker 1950, Universitat Berlin

Donald LeRoy Smith — Iowa
B.S. 1954, Iowa State University

Robert Frederick Stahl — D.C.
B.S. 1954, Washington College

Donald Phillip Stein — D.C.
B.S. 1958, Case Institute of Technology

Wolmar J. Stoffel — D.C.
B.S. 1957, University of Wisconsin

Louise Anderson Terzian — Md.
B.S. 1934, University of Pennsylvania

Robert Thompson — Ill.
B.S. 1958, University of Illinois

James Rintoul Treese — Va.
A.B. 1956, Colgate University

Peter Frank Urbach — Va.
B.S. in E.E. 1957, Carnegie Institute of Technology

Julia Ward — D.C.
A.B. 1923, Ph.D. 1940, Bryn Mawr College

Helen Jeannette Wilbur — Va.
A.B. 1956, Bates College

June 6, 1962

Sanford Astor — Md.
B.S. in Ch.E. 1958, Purdue University

William Keeffe Baggott — Va.
B.S. in I.E. 1957, West Virginia University

Norma Thomson Bannasch — Mich.
A.B. 1957, University of Michigan

Andrew McReynolds Barnes — D.C.
A.B. 1955, Middlebury College

Bernard Marvin Beerman — Md.
A.B. 1959, Princeton University

Marshall Robert Bentzman — Mass.
B.S. 1956, American International College

Ivan Berzins — Va.
B.S. 1958, Michigan College of Mining and Technology

Cohen Richard Beyda — D.C.
A.B. in Govt. 1959, The George Washington University

Gary Bryan Bisson — Va.
A.B. 1959, University of New Hampshire

Eugene Michael Bond — Ohio
B.Ch.E. 1959, Ohio State University

Howard William Braun, Jr. — Va.
A.B. 1956, Colgate University

David Carvel Bryan — Md.
B.S. in B.A. 1955, Georgetown University

David Martin Butowsky — Md.
A.B. 1958, Temple University

Harry S. Carver III — Va.
A.B. 1955, College of William and Mary

Richard Benjamin Chess, Jr. — Va.
A.B. 1957, Tufts University

Alan Elmer Cobb — D.C.
B.S. 1954, Bowling Green State University

Richard Benjamin Cramer — Pa.
A.B. 1957, University of Michigan

Byron Deon Criddle — Va.
B.S. in C.E. 1956, Utah State University of Agriculture and Applied Science

William Prescott Daisley — Md.
A.B. 1959, Randolph-Macon College

Richard Allan DeLorenzo — N.Y.
B.S. 1959, Fordham University

Wallace Gordon Dickson — Va.
A.B. 1959, The George Washington University

Carl Gordon Dowrey — Va.
B.S. 1958, Montana State College

Robert Wells Duckworth — Fla.
B.I.E. 1957, University of Florida

Donald Erskine Egan — Va.
B.S. in Ch.E. 1956, Pennsylvania State University

Price C. Faw, Jr. — Va.
B.M.E. 1954, Clemson Agricultural College

Charles Narber Finney — D.C.
A.B. in Govt. 1959, The George Washington University

Clarence Joseph Fleming — Va.
B.S. in C.E. 1952, University of Illinois

John Gordon Forester, Jr. — N.C.
B.S. 1955, University of North Carolina

Howard Garfield Garner, Jr. — Va.
B.S. in Textile Mfg. 1956, Clemson Agricultural College

Harry Joseph Guerrieri, Jr. — Md.
A.B. 1952, St. Vincent College

Raymond Ernest Hagenlock — Va.
A.B. 1957, Syracuse University

Dennis Haines — Ohio
B.S. in Comm. 1959, Ohio University

Warren Lee Hanna — Va.
A.B. 1955, Washington University

John Loren Harmer — Utah
B.S. 1959, University of Utah

Jon Fisher Hollengreen — Va.
B.S. 1959, University of Tennessee

James Calhoun Humes — Pa.
A.B. 1959, The George Washington University

Ralph Gubler Jorgensen — Md.
A.B. in Govt. 1960, The George Washington University

William Adams Lang — Va.
A.B. in Govt. 1954, The George Washington University

Ronald Louis Lenkin — D.C.
A.B. 1959, The George Washington University

Samuel Harris Lewis — Del.
A.B. 1955, Cornell University

Charles Hutchinson Lindrooth — Va.
B.S. 1956, University of Illinois

Marie Therese Loepp — Iowa
A.B. 1951, University of Iowa

Robert Emmet Lynch, Jr. — D.C.
A.B. 1956, University of Maryland

Lowell LeRoy Madsen — Utah
B.S. 1954, Brigham Young University

Chester Earl Martine, Jr. — Va.
B.M.E. 1958, Rensselaer Polytechnic Institute

Michael Edward McKenzie — Va.
A.B. 1959, Dartmouth College

Stanley Michaels — Va.
A.B. 1959, Cornell University

William Alexander Mikesell, Jr. — Okla.
B.S. 1953, Pennsylvania State University

Stephen Miller — Mass.
A.B. 1959, Michigan State University of Agriculture and Applied Science

Matthew T. Molitch — Md.
B.S. 1957, New York University

John Barnard Nash — Va.
B.S. in M.E. 1935, University of Utah

Gary M. Nateman — Ohio
B.S. in Comm. 1959, Ohio University

Julia Ney Nelson — Va.
A.B. 1944, University of California

Robert Frederick Peterson — Va.
A.B. 1954, University of Idaho

Allen Isaac Polsby — Md.
A.B. 1959, Brown University

Stephen William Pournaras — R.I.
A.B. 1942, Brown University
M.S. 1951, New York University

Robert Morris Price — S.C.
A.B. 1959, University of South Carolina

Samuel Joseph Profeta — N.Y.
A.B. 1957, University of Buffalo

David Arthur Richie — Va.
A.B. 1958, Haverford College

Lonnie Bruce Rubin — Md.
B.S. 1954, University of Maryland

Robert John Seas, Jr. — Va.
B.S. in E.E. 1954, Carnegie Institute of Technology

Jason Lee Shrinsky — Va.
A.B. 1959, University of Pittsburgh

Richard Joel Silber — Pa.
A.B. 1959, Dickinson College

Donald Edward Sinrod — Md.
A.B. in Govt. 1959, The George Washington University

John Rogers Stafford — Va.
(With distinction)
A.B. 1959, Dickinson College

Carl Otis Thomas — D.C.
B.S. 1957, Texas College of Arts and Industries

John Lee Van Metre, Jr. — W.Va.
A.B. 1959, Duke University

William Willison Watkinson — Mich.
A.B. 1959, Western Michigan College

Alfred Hatcher Wells, Jr. — Va.
B.S. in B.A. 1955, University of South Carolina

Don S. Wenger — Texas
A.B. 1934, University of Wisconsin
M.D. 1937, Marquette University
M.S. 1957, Georgetown University

Kathryn Mickle Werdegar — Calif.
(With distinction)
A.B. 1957, University of California

James Field Whitescarver, Jr. — D.C.
A.B. 1953, Duke University

Nancy Jean Wolff — N.Y.
A.B. 1954, Wellesley College

Juris Doctor

October 21, 1961

Vida Marie Baugh — D.C.
A.B. 1950, University of Idaho

George Dennis Becker — Md.
A.B. 1956, Swarthmore College

William Sanford Corey — Md.
A.B. 1958, Dickinson College

Margaret Leslie Ervin — N.C.
A.B. 1952, University of North Carolina

John Smith Jenkins — Pa.
A.B. 1954, Lafayette College

George William King — Va.
B.S. in E.M. 1957, West Virginia University

Martin M. Krawiec — N.Y.
B.S. 1958, Cornell University

John Frederick Moring — Va.
B.S. in I.E. 1957, Virginia Polytechnic Institute

John Joseph Mullins, Jr. — Mass.
B.S. in C.E. 1956, University of Connecticut

Daniel Y. Sachs — N.Y.
B.S. 1955, Cornell University

James Clement Schultz — Nebr.
B.S. 1956, University of Nebraska

William John Swartz — Va.
B.S. in M.E. 1956, Duke University

February 22, 1962

Richard Allen Bartl — Ind.
B.S. 1957, Purdue University

Anne Wells Branscomb — Md.
A.B. 1949, University of North Carolina
A.B. 1949, Georgia State College for Women
A.M. 1950, Radcliffe College

Jerry Cohen — D.C.
B.M.E. 1957, Rensselaer Polytechnic Institute

William Lee Dickey — S.D.
A.B. 1957, Augustana College

Charles Christopher Futterer — Md.
A.B. 1959, University of Maryland

Charles Lindbergh Marinaccio — Conn.
A.B. 1957, University of Connecticut

Robert Cook Sullivan — Me.
B.S. 1955, Brown University

David Arnold Swankin — Md.
A.B. 1954, Brandeis University
M.S. 1957, University of Wisconsin

Jerry Don Williams — Okla.
B.B.A. 1959, University of Oklahoma

June 6, 1962

Robert Franklin Burnett — Va.
B.S. 1956, Clemson Agricultural College

Shirle Arthur Debenham — Utah
A.B. 1959, University of Utah

John Alfred Eschler — Md.
B.S. 1957, University of Maryland

Henry Lyon Hall, Jr. — Va.
A.B. 1953, University of Massachusetts

William Hochman — N.J.
A.B. 1956, Indiana University

Ronald Bruce Natalie — Mass.
(With distinction)
A.B. 1957, Tufts University

Woodie Augustus Partee, Jr. — D.C.
A.B. 1943, University of Georgia

Harold Pezzner — Md.
B.S. in I.E. 1958, Pennsylvania State University

Gordon Jay Quist — Mich.
A.B. 1959, Michigan State University of Agriculture and Applied Science

Carl Walter Schwarz — Wis.
B.C.E. 1958, Cornell University

John Vernon Skinner, Jr. — Ga.
B.S. 1955, Auburn University

John Earl Faulbee — Ill.
A.B. 1958, St. Ambrose College

Max Volterra — Mass.
B.S. 1957, Brown University

Master of Laws

October 21, 1961

David William Johnson — N.Y.
B.S. 1952, Brooklyn College
LL.B. 1959, The George Washington University

Mordecai C. Johnson — S.C.
A.B. 1951, South Carolina State College
LL.B. 1959, Howard University

February 22, 1962

Charles Austin Barth — Va.
A.B. 1952, LL.B. 1954, Indiana University

Edward Joseph Connors, Jr. — Mass.
B.S. 1954, University of Notre Dame
LL.B. 1959, Georgetown University

Kitty Blair Frank — D.C.
A.B. 1943, University of Wisconsin
J.D. 1950, The George Washington University

Marvin Floyd Matthews — Texas
A.B. 1957, University of Rochester
LL.B. 1960, American University

Harold Sidney Schneiberg — D.C.
A.B. in Govt. 1957, LL.B. 1960, The George Washington University

June 6, 1962

Robert Frederick Allnutt — Va.
B.S. 1957, Virginia Polytechnic Institute
J.D. 1960, The George Washington University

William Montgomery Champion — Miss.
B.S. 1954, Mississippi State College
LL.B. 1961, University of Mississippi

Eugene Driker — Va.
A.B. 1959, J.D. 1961, Wayne State University

Lawrence Joseph Fuller — Mich.
B.S. 1940, U.S. Military Academy
J.D. 1951, University of Michigan

Charles Stanley Hall — Md.
A.B. 1948, McKendree College
LL.B. 1953, Wayne State University

Daniel E. Henderson, Jr. — Texas
A.B. 1955, Trinity University
LL.B. 1958, University of Texas

Robert Frederick Knepp — D.C.
A.B. 1935, Duke University
LL.B. 1946, The George Washington University

William Hale Watkins — Va.
A.B. 1958, LL.B. 1960, West Virginia University

Master of Comparative Law (American Practice)

February 22, 1962

Diana Hayward Josephson — D.C.
A.B. 1958, Somerville College, England

Doctor of Juridical Science

February 22, 1962

Edward Gerard Hudon — Maine
B.S. 1937, Bowdoin College
LL.B. 1947, LL.M. 1950, Georgetown University
M.S. in L.S. 1956, Catholic University of America
Dissertation: "The Evolution of First Amendment Doctrines in the Supreme Court: An Historical Study of Cases on Freedom of Expression"

Robert B. Ellert — N.Y.
A.B. 1945, B.C.L. 1949, College of William and Mary
Postgraduate Diploma in Law 1956, Kings College, University of London, England
Dissertation: "NATO 'Fair Trial' Safeguards: Precursor to an International Bill of Procedural Rights"

June 6, 1962

Cecil Thomas Lakes — Ohio
A.B. 1948, LL.B. 1950, University of Cincinnati
LL.M. 1962, The George Washington University
Dissertation: "Extraordinary Contractual Authority in Government Defense Procurement"

Sherwin Carl Pelton — Wis.
B.B.A. 1950, LL.B. 1952, University of Wisconsin
LL.M. 1955, New York University
DISSERTATION: "Manufacturers' Excise Taxes"

THE SCHOOL OF ENGINEERING

BACHELOR OF CIVIL ENGINEERING

FEBRUARY 22, 1962

Ignat Vassileff Kalcheff — Va.

JUNE 6, 1962

Dulaney Forrest deButts III	Md.	Floyd Francis Mathews, Jr.
Wesley Grieves Harris, Jr.	Va.	Arthur Thomas Nielsen
Howard Thiebaut Hill (With distinction)	D.C.	Paul Albert Oscar

BACHELOR OF ELECTRICAL ENGINEERING

FEBRUARY 22, 1962

Frederick John Gauvreau	Md.	Robert Glenn Martin
Andrejs Jaunrubenis	D.C.	Edward Ronald Sebol
David Thornton Lokerson	Md.	

JUNE 6, 1962

James E. Birdsall	N.Y.	Donald Curtis Lokerson
Fabio Antonio Convers Echeverría	Colombia	Paul James McCeney
John Aloysius Gilson, Jr.	Md.	Theodore Herman Roech
Jerre Bradford Hartman	Va.	Walter Godfrey Santilli
Larry Charles Hice	Va.	Edwin Anthony Stennett
Randall C. Kenyon	Md.	John Leonard Wolfgang, Jr.

BACHELOR OF MECHANICAL ENGINEERING

OCTOBER 21, 1961

David S. Bettwy — Va.

FEBRUARY 22, 1962

Richard Dettmering	Md.	William Hammond Mish

JUNE 6, 1962

Alan Brooke Griest	Md.	Stuart L. Natof
Arthur Caldwell Macurdy	Md.	Robert Joseph Sanford
Norman Lawrence Martin	Md.	David Knowlton Trask
Daniel Russell Mulville	Md.	

BACHELOR OF SCIENCE IN ENGINEERING

OCTOBER 21, 1961

Robert Anderson Broadway	Va.	Aubrey Jackson Stringer
William J. D. Escher	Md.	

FEBRUARY 22, 1962

Michael Beatty Rowan — Md
A.B. 1952, A.M. in Govt. 1956, The George Washington University

JUNE 6, 1962

Stephen Caine	Va.	Harold Jay Rosenberg
John Wells Casey, Jr.	Md.	Wallace Mason Yater, Jr.
Robert Carey Kirkland	Va.	

Master of Engineering Administration

October 21, 1961

Warren Francis Austin — Ohio
B.S. in E.E. 1941, University of California

Robert Brendon Keating — D.C.
B.S. 1946, U. S. Naval Academy

William Henderson Mason — Ark.
B.S. 1946, U. S. Military Academy
B.S. 1950, Oklahoma State University

Joe Albert McEachern — Tenn.
B.S. in M.E. 1951, University of Tennessee

George Edward Morrissey, Jr. — D.C.
B.S. 1950, U. S. Military Academy

February 22, 1962

Robert Berger Abel — Md.
B.S. 1947, Brown University

Evan Drexel Anderson — Md.
B.S. 1948, Upsala College

Joseph Riley Bracewell, Jr. — Va.
B.S. in C.E. 1932, Georgia Institute of Technology

Bruce Wendell Caron — Vt.
B.S. in E.E. 1932, Norwich University

Sheldon Chesis — N.Y.
B.M.E. 1956, College of the City of New York

Louis Brockway Chen Fong — D.C.
B.S. in E.E. 1935, Massachusetts Institute of Technology

Edwin Stanton Foster — Md.
B.S. 1929, University of Illinois

Walter Bernhard Grautoff — Md.
B.S. in M.E. 1933, New York University

Frank Powell Hamilton — Fla.
B.S. 1953, U. S. Naval Academy

Arthur Leslie Kenny — Md.
A.B. 1954, New York University
M.S. 1960, University of Rochester

Leon Herbert King — Va.
B.E.E. 1955, The George Washington University

Edward Andrew Kmosena — Ill.
B.S. in E.E. 1956, Northwestern University

Bruce Edward Lackey — Va.
B.E.E. 1934, Rensselaer Polytechnic Institute

James Augustus McGill, Jr. — Va.
B.S. in C.E. 1956, University of Maryland

Leonard Jay Miller — Conn.
B.S. in Textile Eng. 1957, Lowell Technological Institute

Thaddeus Michael Nosek — Conn.
B.S. 1940, U. S. Military Academy
M.S. in C.E. 1947, Massachusetts Institute of Technology

James McClain Osborn — Va
B.S. 1937, M.S. 1939, University of Maryland

Leonard Plotkin — Md.
B.E.E. 1952, The George Washington University

Wilfred Morton Redler — Md.
B.E.E. 1953, The George Washington University

Robert Lona Rush — Md.
B.S. 1953, U. S. Military Academy

Charles Aubrey Stille — Va.
B.S. in I.E. 1951, Virginia Polytechnic Institute

Dominick Robert Traina — D.C.
B.S. 1942, University of Maryland
B.M.E. 1958, The George Washington University

June 6, 1962

Earl J. Baas — Md.
A.B. 1950, Catholic University of America

William Edward Bettis — Texas
B.S. in E.E. 1958, Oklahoma State University of Agriculture and Applied Science

Eugene Patrick Bowler — D.C.
B.S. 1937, M.S. 1939, Pennsylvania State University

William Barclay Buchanan — N.Y.
B.S. 1957, University of Rochester

Talbott Ferdinand Collins — Ill.
B.S. 1946, U. S. Naval Academy

J. Allen Crocker — Md.
B.S. in E.E. 1933, The George Washington University

Richard Griffith Donaghy — Va.
B.S. in M.E. 1956, Drexel Institute of Technology

Willard Blake Foster — Mass.
B.S. 1960, Massachusetts Institute of Technology

Russell Francis Goodacre, Jr. — Calif.
B.S. 1949, U. S. Naval Academy
B.S. in E.E. 1955, U.S. Naval Postgraduate School

Frederick Walter Jacoby — Pa.
B.S. 1947, U. S. Military Academy

Neal C. Jennings — Va.
B.S. in C.E. 1949, Iowa State College of Agriculture and Mechanic Arts

Edward Joseph Kaputa — Md.
B.E.E. 1955, New York University

Raymond Vincent Knazek — Md.
B.S. in B.A. 1947, Scranton University
B.S. in I.E. 1949, Pennsylvania State University

Vincent D. Lee-Thorp — Va.
B.S. 1950, University of Witwatersrand, South Africa

Bryant William Lemon — Idaho
B.S. in C.E. 1958, University of Idaho

Edward Wallace MacLaren, Jr. — Va.
B.S. in Eng. 1960, The George Washington University

James Richard Miller — Mo.
B.S. 1955, U. S. Military Academy

Robert Herman Nyvold — Va.
B.S. 1952, U. S. Naval Academy

Wilson Andrew Reaves, Jr. — Md.
B.S. in C.E. 1952, University of Texas

Maurice Eugene Ringenbach — Md.
B.S. in E.E. 1948, Polytechnic Institute of Brooklyn

John Philip Ryan — Va.
B.S. 1951, Fordham University

James Glenn Whiteaker — Tenn.
A.B. 1940, Lincoln Memorial University
B.S. in E.E. 1951, U. S. Naval Postgraduate School

Michael Yachnis — D.C.
B.S. 1943, Military College, Athens, Greece
B.S. 1951, Military Technical Training College, Greece
M.S. in Eng. 1956, The George Washington University

Master of Science in Engineering

October 21, 1961

Jhong Sam Lee — Korea
B.S. in E.E. 1959, University of Oklahoma

February 22, 1962

Roland Dee August — Va.
B.S. in E.E. 1958, Oregon State College

William Frank Banks — Md.
B.S. 1946, Texas Agricultural and Mechanical College
M.S. 1958, University of California at Los Angeles

Matthew McCartney Douglass — D.C.
B.C.E. 1952, McGill University

Lyman William Griswold — Md.
B.S. in E.E. 1955, Duke University

Charles William Haase — Md.
B.E.E. 1956, Rensselaer Polytechnic Institute

George Elert James — D.C.
B.S. in E.E. 1940, University of Washington

James Allen Nott — D.C.
B.S. 1956, University of Maryland

Federico Manns Rudloff — Chile
Ingeniero Civil 1948, Universidad de Chile

William David Rust, Jr. — D.C.
B.S. in C.E. 1954, Howard University

Herman I. Shaller — Md.
A.B. 1941, Brooklyn College
B.M.E. 1951, The George Washington University

Ralph Boon Snapp — Md.
B.S. in M.E. 1948, Carnegie Institute of Technology

Donald Colman Titus — Md.
B.E.S. 1957, Johns Hopkins University

Panos Tsoukias — Greece
Diploma 1953, Athens University, Greece

Frank Herbert Utley — Md.
B.E.E. 1954, The George Washington University

June 6, 1962

Lewis Horrigan Blakey — D.C.
B.S. in C.E. 1954, University of Notre Dame

Simeon Henry Cotton, Jr. — Va.
B.S. in E.E. 1957, Duke University

George Frederick Crowe — Va.
B.S. in C.E. 1933, University of Washington

Robert Warren Dacus — Md.
B.E. 1954, Vanderbilt University

Chao Kai Fang — Md.
B.S. in E.E. 1944, National Sun Yat-Sen University

Solomon Sidney Fineblum — Ohio
B.M.E. 1950, The George Washington University

Ralph Harrison Gaze — D.C.
B.S. in E.E. 1956, Massachusetts Institute of Technology

James George — Md.
B.S. 1930, Massachusetts Institute of Technology

Oscar T. Hines, Jr. — Md.
B.S. in E.E. 1955, Duke University

James Richard Lear — D.C.
B.E.E. 1959, The George Washington University

Buford Atwell Logan, Jr. — Va.
B.S. in E.E. 1957, Mississippi State University

George Lucky — Va.
B.C.E. 1960, The George Washington University

Robert Milton Moore — Va.
B.S. in Eng. 1959, The George Washington University

David Hardy Nelson — D.C.
B.S. in E.E. 1957, University of California

Alvin Huey Sobel — Pa.
B.S. in E.E. 1959, University of Pennsylvania

Ralph Edwin Spencer — D.C.
B.S. in C.E. 1953, Howard University

Persiado Dick Tadjer — D.C.
B.S.C. 1954, M.S.C. 1957, Israel Institute of Technology, Israel

Doctor of Science

February 22, 1962

Clifford Duras Ferris — D.C.
B.S. in E.E. 1957, M.S. in E.E. 1958, University of Pennsylvania
Dissertation: "On Some Phenomena of Interaction of Electromagnetic Fields with Moving Electrically Conducting Fluids with Application to Biological Flowmetry: A Critical Study"

THE SCHOOL OF PHARMACY

Bachelor of Science in Pharmacy

October 21, 1961

Rosemary Ruth Franzone — Md.

Jay Leslie Morton — D.C.

JUNE 6, 1962

Melvin Aaron Baron	D.C.	John Graham Marshall D.C.
Kenneth Lee Dwyer	Va.	Leon Leonard Nelson D.C.
James Richard Ebden	Va.	Matthew John Nevins, Jr. Md.
Mary Elizabeth Fischman	D.C.	Peter George Pentchev Md.
Ronald Benjamin Guttmann	D.C.	Jean Franklin Pichler D.C.
Maria Elizabeth Hornung	D.C.	Edward Saul Schwartz D.C.
Sister Amatilia Klodt	Ill.	Sally Ann Tuomala Mich.
Phillip Waple Legg	D.C.	Arthur Horace Wear Md.
Estelle Deborah Luber	D.C.	B.S. 1957, University of Maryland
(With distinction)		

THE SCHOOL OF EDUCATION

BACHELOR OF ARTS IN EDUCATION

OCTOBER 21, 1961

Lucille C. Duffield	Va.	Reva Lehman Va.
Mary Louise Duncan	D.C.	Martha Jane Mitchell Md.
Johanna Deborah Fox	D.C.	(With distinction)
Shirley Page Furr	Va.	Russell Fredric Olsen Md.
Michael Hyle Jessup	Va.	Dorothy Elizabeth Sarbaugh Va.
Jean Kertzman	Md.	Mary Heath Sweet Va.
M. Rosalie Kim	Md.	Francis Ogden Van Wie D.C.

FEBRUARY 22, 1962

Patricia Mann Crenshaw	Va.	Sharon Geoghegan Harrison Md.
Mary Alice Ferris	Md.	Edward Eugene Hunsion Md.
Marjorie Simons Gates	Va.	Sally Kathryn Locker Link Brazil
Gay Wallace Glading	Va.	Helen Zarkower Miller Md.

JUNE 6, 1962

Linda Jane Abrams	Pa.	Elaine Rochelle Kupersmith D.C.
Susan Phyllis Badger	Va.	Carol Elizabeth Lander Va.
Louise A. Bassett	D.C.	Cecilia Ann Maisel Va.
Billie Wickman Bernett	Va.	Herman Richard Menzer, Jr. Va.
David Carlton Booker	Va.	Dorothy Beller Morgan Md.
Donald Reid Bridges	Va.	Susan Deredith Mosher Va.
Gloria Sebastian Butland	D.C.	Carlyne Mae Olive Ala.
(Special honors in Business Education)		Virginia McGehee Parks Va.
Christine Cate	Va.	Kaleen Kissinger Peck D.C.
Violet A. Clark	Va.	(With distinction)
(Special honors in Biology)		Angela Nancy Ann Pecorella N.J.
Jane Carol Davis	Va.	Melissie Collins Pemberton D.C.
Virginia Lee Douglass	Va.	Willo Ann Pequegnat D.C.
Ronna Brand Eppner	Va.	Geraldine Marie Pierce D.C.
Carolyn Della Gaines	D.C.	Nguyen tu Quy Viet Nam
John Deane Gannon, Jr.	Md.	Esther Manette Ratner Md.
Pearl Rappaport Gordon	Md.	Joyce Elaine Raum D.C.
Mary Esther Grover	Md.	Nancy Beth Pittle Rose D.C.
Harley Gail Hellman	D.C.	Carolyn Kay Rowsey Va.
Patricia Dooley Hole	D.C.	Sheila Schlossenberg Md.
Barbara Joan Kahn	Ariz.	Marilyn Louise Schroeder Va.
Joan Kaiser	D.C.	Isabelle Sweeny Schuessler Md.
Nancy Ann Kane	D.C.	Virginia Louise Scott Minn.
Arlene Marian Kevorkian	D.C.	Louise Marie Spauls Va.
(With distinction)		Marcia Elizabeth Thompson Va.
Kathryn Lyane Koelz	Va.	Eileen Ann Wishner D.C.

BACHELOR OF SCIENCE IN HOME ECONOMICS

FEBRUARY 22, 1962

Arlene Rawdon Bray	D.C.

JUNE 6, 1962

Alinda Ann Arthur	Va.	Annie Mae Houston McElrath D.C.
Bette Phillips Hagan	Ky.	Anne Bigelow Oakley N.Y.
Joan Loueen King	Va.	

Bachelor of Science in Physical Education

October 21, 1961

Richard Bohdan Markowitz	Pa.	Joseph John Paluck	Pa.
Charles Domenick Packan	Pa.		

February 22, 1962

Dennis Wesley Hill	Va.	Walter John Lizenza	Pa.
James Patrick Kacsmarik	Va.	Daniel Edmund Solt	Va.

June 6, 1962

Fred Eugene Beahm	W.Va.	Robert Nelson Harvey	Va.
Robert Roy Budway	D.C.	Charles William Hornfeck	Pa.
Nan Southey Byrd	D.C.	Frederick Joseph Manuel	N.J.
(With distinction)		Gloria Jean Nethers	Va.
Joseph George Coniglio	Pa.	William Thomas Pashe	N.J.
Phillip Gordon Coreil	La.	Robert Franklin Sisson, Jr.	Va.
Douglas Morgan Crupper, Jr.	Va.	Alexander Gregory Sokaris	N.Y.
Andrew A. Guida	Pa.	James Mauro Tricolli	Pa.

Master of Arts in Education

October 21, 1961

Irene P. Allemano — Va.
A.B. 1940, Carnegie Institute of Technology

Peter H. Allemano — Va.
B.S. 1935, Carnegie Institute of Technology

Guinevere F. Wilhite Anderson — Ky.
A.B. 1953, Fisk University

Margarita Arzuaga — Puerto Rico
A.B. 1952, University of Puerto Rico

Helen G. Butcher — Md.
A.B. 1950, Davis and Elkins College

Olive Jones Byrd — D.C.
B.S. 1942, D. C. Teachers College

Ella Virginia Carter — D.C.
B.S. 1958, Longwood College

William Boyd Chapman — Va.
B.S. 1959, University of Virginia

Carroll Edward Conner — Va.
A.B. 1951, Bridgewater College

Ruby Virginia Cross — N.C.
A.B. 1938, King College

Phyllis Dysert Culbage — Md.
B.S. in Ed. 1948, Northern Illinois State Teachers College

Margaret E. Smith Davis — Md.
A.B. in Ed. 1952, The George Washington University

Robert Olin DeWolfe — Va.
B.S. in Ed. 1957, Pennsylvania State Teachers College, Bloomsburg

Frances Ayers Dieffenbach — Va.
A.B. 1930, Southern Methodist University

Thelma Elaine Driscoll — Va.
A.B. in Ed. 1959, The George Washington University

Kathryn Anne Berry Duvall — Md.
B.S. 1957, University of Maryland

Margaret Stephens Ferguson — Va.
A.B. 1938, Roanoke College

Allen R. Frazee — Va.
A.B. in Ed. 1955, Fairmont State College

Preston Garrison Freeman — Md.
B.S. 1955, Morgan State College

Patrick Richard Glott — Va.
B.S. 1949, California State Teachers College

William Francis Hauptman — Md.
B.S. in P.E. 1954, The George Washington University

Ruth Wilson Heintze — D.C.
B.S. 1938, University of Maryland

Harold Leroy Hodge — Va.
A.B. 1950, John B. Stetson University

Herman Armstead Howard — Va.
A.B. 1954, Virginia Union University

Ruth Ann Lasiter Howell — Va.
B.S. 1956, D. C. Teachers College

Thomas Woodley Knott — Md.
B.S. 1955, Georgetown University

Frank William Kovacs — Va.
B.S. in P.E. 1956, The George Washington University

Donald Lacey — Md.
A.B. 1958, The George Washington University

Josephine Lowstuter — Md.
B.S. 1937, University of Pittsburgh

Bette Jean McLeod — Md.
B.S. 1955, Hampton Institute

John Joseph McNelis — Md.
B.S. 1951, University of Scranton

Robert Emit McNelis — Md.
B.S. 1954, Pennsylvania State Teachers College, West Chester

Vivian Covington Miller — D.C.
B.S. 1955, D. C. Teachers College

David Alan Mitchell — D.C.
A.B. 1956, University of Virginia

Jacqueline Richards Moore — Va.
B.S. 1956, D. C. Teachers College

Sally Ann Nelson — Va.
B.S. 1952, Nazareth College

Pauline Detamore Parsons — Va.
B.S. 1949, Morris Harvey College

Marie Agnes Peckham — Va.
B.S. in Ed. 1929, University of Pennsylvania

Frances B. Rawls — Va.
B.S. 1940, Florida Southern College

Margaret Roebling Robinson — D.C.
B.S. 1941, Teachers College of Connecticut

John Robert Rosser, Jr. — D.C.
B.S. 1958, D. C. Teachers College

Edith Anne Stern — Md.
A.B. 1958, The George Washington University

John Rowan Stewart — Va.
B.S. 1947, Pennsylvania State Teachers College, Shippensburg

Barbara Louise Sutton — D.C.
A.B. 1953, Brown University

Willa Satterfield Suzuki — Va.
B.L. 1947, University of Toledo

Kate Wheat Thomas — Md.
A.B. 1943, Bryn Mawr College

Robert Edward Travers, Jr.
B.S. 1951, Maryland State Teachers College, Salisbury

Eleanor James Vaughan — D.C.
B.S. 1942, University of Maryland

Florence Morrow Wilson — Md.
A.B. 1930, Center College

Rita Eronimous Winterbourne — Md.
B.S. in Ed. 1950, New York State College of Education, New Paltz

Helen Osbey Wolfe — Va.
A.B. 1940, Morningside College

February 22, 1962

Derek Ripley Adams — Va.
B.S. in Ed. 1957, North Dakota State Normal and Industrial College

Frederick Fowler Adams — Va.
B.S. in P.E. 1951, The George Washington University

Marie Ward Adrian — Md.
A.B. 1937, American University
B.S. 1941, D. C. Teachers College

Youssia Ali Badran — D.C.
B.S. 1953, Ein Shams University, Egypt

Virginia June Barton — D.C.
A.B. 1957, West Virginia University

Gloria Elizabeth Blaylock — D.C.
B.S. 1956, D. C. Teachers College

Woodrow Wilson Bogie — Ky.
A.B. 1937, Western Kentucky State College

James Townsend Bowen — Va.
A.B. 1953, University of Southern California

Nancy Burke Boyd — Md.
A.B. 1949, Duke University

Annalee Armistead Brookes — Va.
B.S. 1956, D. C. Teachers College

Richard Clayton Claypool — Va.
B.S. in P.E. 1958, The George Washington University

Antoinette Johnson Corprew — D.C.
A.B. 1949, Howard University

Richard Mullen Gaskell — Md.
A.B. 1955, The George Washington University

Trenice Dodek Goldstein — Md.
A.B. 1948, University of Michigan

Vernon Elmer Greaver — Va.
A.B. 1951, A.M. 1953, The George Washington University

Robert Lee Green — Va.
B.S. in Ed. 1957, Texas Technological College

Shendrine Boyce Henry — D.C.
A.B. 1940, Hunter College

Herman Keith, Jr. — Va.
B.S. in Ed. 1957, Pennsylvania State Teachers College, California

Margaret Carr Kuypers — Md.
B.S. 1957, Maryland State Teachers College, Towson

Alan Herbert Kyber — Md.
A.B. 1956, Furman University

Augustus Lynch Lacey — Va.
B.S. 1934, New York University

Norman James Landry — N.H.
B.S. 1950, University of Pennsylvania

Hazel Garver Leland — D.C.
B.S. 1948, D. C. Teachers College

Sally Ann Mack — D.C.
B.S. 1957, Maryland State Teachers College, Towson

James Patrick McCauley — Md.
B.S. 1953, D. C. Teachers College

Saunders Benn Moon — Va.
B.S. in Ed. 1938, Bluefield College

John Otis Peterson — D.C.
B.S. 1956, Virginia Union University

Joyce Keemer Peterson — D.C.
B.S. 1957, Virginia Union University

Florence Lyons Price — Va.
A.B. 1938, New York University

Florence Larson Redding — Va.
B.S. 1942, St. Cloud State College

Wilma Tulman Schneiberg — D.C.
A.B. 1960, The George Washington University

Mamie Ballentine Vaughan — Va.
B.S. 1934, Winthrop College

Robert William Wilson — W.Va.
A.B. 1951, West Virginia University

June 6, 1962

Eugene George Branchi — Va.
B.S. in P.E. 1958, The George Washington University

Ruth-Lois Cotter Bryson — D.C.
A.B. 1949, Mary Washington College

Constance Carolyn Butler — N.Y.
B.S. 1932, Barnard College

Mary Foster Cage — Md.
A.B. 1940, Hood College

John Henderson Caldwell — Tenn.
B.S. 1940, U. S. Naval Academy

Violet Fonner Carrick — Md.
A.B. 1958, Western Maryland College

Marie H. Carstater — Va.
A.B. 1928, Bucknell University

Betty Lou Cobb — Md.
B.S. in Ed. 1954, Delta State College

Herbert Collins, Jr. — D.C.
B.S. 1955, D. C. Teachers College

Wilma Becky Combs — Md.
B.S. in Ed. 1958, University of Maryland

Josephine De Marzo Diliberto — Md.
A.B. 1937, Montclair State College

John Bagley Dimmick — Va.
B.S. 1930, U. S. Naval Academy

Dana Lee Dudley — Va.
A.B. 1949, Harvard University

Chester Glen Elder — Md.
A.B. 1949, Glenville State College

Norman Lawson Fowler — Va.
B.S. in Ed. 1958, Pennsylvania State Teachers College, Bloomsburg

Kenneth Aloysius Fulton — Pa.
A.B. in Ed. 1960, The George Washington University

Martin Thomas Gallagher — Md.
B.S. in P.E. 1957, The George Washington University

Ruth Arline Goodling — Pa.
B.S. 1950, Pennsylvania State Teachers College, Indiana

Emeline Louise Green — D.C.
A.B. 1955, Brown University

Warrick Samuel Hill — Md.
B.S. 1950, Morgan State College

Arthur Elmo Jenkins — D.C.
B.S. in P.E. 1953, Virginia State College

Elouise Letson Johnson — Fla.
A.B. 1936, Mississippi State College for Women

Kathryn M. Jones — D.C.
B.S. 1953, Maryland State Teachers College, Bowie

Laurence William Jones — Calif.
Ed.B. 1940, University of California at Los Angeles

Jack Charles Kalbaugh — Md.
B.S. 1952, Maryland State Teachers College, Frostburg

Mary Elizabeth Kerby — Md.
B.S. 1958, Maryland State Teachers College, Towson

Arthur William Kirkland — D.C.
A.B. 1942, West Liberty State College

Mary Catherine Lamm — Iowa
A.B. 1953, State University of Iowa

Pasquale Leo — N.Y.
B.S. in S.S. 1955, LeMoyne College

Marilyn V. Lichtman — Va.
A.B. in Ed. 1959, The George Washington University

Henry Grady MacDaniel — Ala.
B.S. in P.E. 1934, University of Alabama

Slater Eugene Marshall — Va.
A.B. in Ed. 1961, The George Washington University

Charles Frederick McIntosh — Md.
A.B. 1956, University of California at Los Angeles

Susan Diane Medalie — D.C.
A.B. 1960, Sarah Lawrence College

Irene D. Menassa — D.C.
B.S. 1938, University of Chicago

Harrieton Lionel Merritt — Md.
A.B. 1949, Glenville State College

Alexander M. Miller III — Md.
B.S. 1927, U. S. Military Academy

Lee R. Miller — Va.
A.B. 1949, Dickinson College

Sara Ellyn Moultrie — D.C.
A.B. 1933, West Virginia State College

Mary Williamson Obenchain — Va.
B.S. 1945, Birmingham Southern College

Albert A. Ortega — N.M.
A.B. 1958, New Mexico State University of Agriculture, Engineering, and Science

Dorothy Andrews Owens — Va.
A.B. 1942, Cornell University

Burton Lord Parke — Md.
B.S. 1941, U. S. Naval Academy

Nathan Parke Pearson — Md.
B.S. 1955, Pennsylvania State Teachers College, Shippensburg

Isabel Barbara Portadin — Va.
A.B. 1958, New York University

Ann Stamps Poulson — Va.
A.B. 1947, Vassar College

Marco Nicholas Psarakis — Conn.
A.B. 1961, Trinity College

Howard Rowlands — Va.
A.B. 1956, Pennsylvania State University

Sheila Joann Scanlan — Minn.
B.S. 1955, D. C. Teachers College

Mercedes Shute-Wilson — D.C.
B.S. in H.E. 1932, Kansas State University of Agriculture and Applied Science

George Edwin Stump — Pa.
A.B. 1959, Otterbein College

Carl Tang — Md.
A.B. 1960, Georgetown University

Ruth Trimble — Va.
B.S. 1939, College of William and Mary

Helen South Trucksess — Va.
A.B. 1929, Butler University

Clarke Freeman Trundle — Md.
A.B. in Ed. 1959, The George Washington University

Harold William Turner — Va.
B.S. in B.A., A.B. in Sec.Ed. 1957, Shepherd State College

Robert Giroux Vaughn — D.C.
B.S. in Ed. 1951, University of Maryland

Jose Manuel Viqueira, Jr. — Md.
B.S. 1956, D. C. Teachers College

Patricia Ann Watson — Va.
B.S. 1953, Marquette University

Beatrice Edith Welton — Va.
B.S. 1936, University of Illinois

Joan Eileen Wenger — Md.
A.B. 1960, Dunbarton College of the Holy Cross

Rebecca Tucker Winn — Va.
B.S. in Ed. 1948, Longwood College

Jewell Humes Woods — D.C.
B.S. 1954, D. C. Teachers College

Advanced Professional Certificate

October 21, 1961

Grace Wright Horton — Va.
A.B. 1938, Shaw University
A.M. 1948, Columbia University

Andrew Robert McKelvie — D.C.
A.B. 1936, St. Vincents College
A.M. in Ed. 1958, The George Washington University

Philip B. Melody — Va.
B.S. in Ed. 1933, University of Illinois
A.M. in Ed. 1954, American University

Herbert Louis Mitchell — D.C.
B.S. 1951, Maryland State Teachers College, Bowie
A.M. 1957, New York University

Spicer Peterson — Va.
A.B. 1938, Virginia Union University
A.M. 1947, New York University

Barbara Klotz Stathis — Md.
B.S. 1947, D. C. Teachers College
A.M. in Ed. 1958, The George Washington University

Mary M. Vidnovic — Va.
A.B. 1939, Trinity College
A.M. 1940, Ohio University

February 22, 1962

Rachel Ruth McKay — Md.
B.S. in Ed. 1943, Pennsylvania State University
A.M. in Ed. 1958, The George Washington University

Virginia McBride McMillan — W.Va.
A.B. 1935, Shepherd State College
A.M. in Ed. 1941, The George Washington University

June 6, 1962

Henry Frederick Busky — Md.
B.S. in P.E. 1955, A.M. in Ed. 1961, The George Washington University

Anna Beulah Furr — Md.
B.S. 1944, D. C. Teachers College
A.M. in Ed. 1951, The George Washington University

Margaret Miriam Johnson — Md.
B.S. in Ed. 1942, Pennsylvania State Teachers College, California
A.M. in Ed. 1952, The George Washington University

Cecil Marnette Robinson — D.C.
B.S. 1948, Virginia State College
A.M. 1951, New York University

Lawrence Gordon Strickland — Va.
A.B. 1947, A.M. in Ed. 1959, The George Washington University

Charles Dorsey Walters — Md.
B.S. 1948, Ed.M. 1953, University of South Carolina

Doctor of Education

October 21, 1961

Harry Grubb Detwiler — Va.
B.S. in Ed. 1936, Pennsylvania State Teachers College, West Chester
A.M. in Ed. 1952, The George Washington University
Dissertation: "An Analysis of Student Teachers' Difficulties as Related to Selected Factors"

Wilda Freebern Faust — D.C.
A.B. 1929, Iowa State Teachers College
A.M. 1943, University of Florida
Dissertation: "The Readiness of First-year Degree Teachers for Professional Organizations: A Comparative Study of Members and Nonmembers of the Student National Education Association"

February 22, 1962

Robert Edward Baker — Md.
B.S. in Ed. 1939, State University of New York
A.M. 1954, Catholic University of America
A.M. in Ed. 1956, The George Washington University
Dissertation: "Changing Expectations for the American Elementary School Teacher: Selected Teaching Ability Requirements as Revealed by an Analysis of State Courses of Study, 1930-1961"

George Samuel Foster — Tenn.
B.S. in Agr.Ed. 1943, University of Tennessee
A.M. in Ed. 1948, The George Washington University
Dissertation: "An Evaluation of Supervision of Volunteer Leaders in Tennessee 4-H Club Work"

June 6, 1962

Marcella Siegel Bernstein — D.C.
B.S. in Ed. 1934, Johns Hopkins University
A.M. 1949, American University
Dissertation: "The Parent - Teacher Conference: An Analysis of Selected Conference Problems"

John Morrison King — Md.
A.B. 1929, Central State College, Okla.
A.M. 1935, University of Oklahoma
Dissertation: "Organization and Functions of the Central Staff of the Superintendent in Suburban School Districts with Populations of 10,000 to 100,000"

Luther Franklin Sies — Iowa
A.B. 1948, Ed.M. 1954, Western Maryland College
B.S. in Ed. 1950, Maryland State Teachers College, Towson
Dissertation: "The Number, Intensity, and Persistence of Professional Problems of Beginning Elementary School Teachers as Related to Patterns of Teacher Preparation"

The School of Government, Business, and International Affairs

Bachelor of Arts in Government

October 21, 1961

Mary Ellen Foster
Blaine Kenneth Katz
Euripides D. Pikrallidas

Jack J. Rodden — Pa. — N.M.
Mary L. Whittington — Mich. — Wyo.
Robert Edward Williams, Jr. — Va. — Fla.

February 22, 1962

Adrian Bernard Ciazza
Lynn Frederick Fischer
Edwin Abbott Franklin, Jr.
Martin Arnold Herta

Maria Helen Lapi — Va. — N.Y.
Joseph Hugh Macauley — Ill. — Iowa
Janet Eileen Morrissey — D.C. — Kans.
Chin Ha Suk — D.C. — Korea

June 6, 1962

David Jeremy Blow
Nelson Harry Coar, Jr.
Charles H. Crowl
Judith Ellen Crumlish
George Thomas Desorcy
Paula Roberta Fortucci
(With distinction)
Benjamin Arthur Gold
Janet Irene Green
Terrence Winfield Hall
Mollie Ann Harper

Ruth Frances Hollandt — N.Y. — Mich.
John Knight Hord — Del. — Va.
Myron Michael Kline — Va. — Va.
John G. Lent — Pa. — Calif.
Dina Modianot — Mass. — N.Y.
Jean Marian Myers — Va. — D.C.
Mary Alice Myers — D.C.
Leon Pensky — D.C. — Md.
Cameron Leon Pippitt — Mo. — D.C.
Morton Herbert Press — Va. — D.C.
Imelda D. Prokopovitsh — D.C. — Md.

Harry Bryce Qualman — Conn.
David Franklin Reynolds — Va.
Carl Donaldson Schultz III — D.C.
Sheldon Paul Schuman — Md.
Deanne C. Siemer — N.Y.
(With distinction)
David George Tuerck — Ill.
Robert Hayward Volland
Thomas K. Wagner
Mary Kathleen Welsh
Gary Earl Williams
Cesar Santiano Wycoco
Sergei Alexis Yonov

Bachelor of Business Administration

October 21, 1961

Hugh Leonard Brennan — D.C.
Horace Judd Everett — D.C.
Donald Joseph Lazas — Md.
Sherman Lazrus — Md.
Harold Eugene Manley — Va.
(With distinction)
Diana Beatriz Merediz
Robert Stephen Ridgway
Robert John Risteen
Anthony Salimone

February 22, 1962

Quincy Adams, Jr. — D.C.
Gary David Badoud — Md.
Edgar George Bowers — Md.
Thomas William Brewster — D.C.
Charles Robert Brun — D.C.
James Patrick S. Devereux II — D.C.
Harold Bernard Devlin — Va.
Edward Ernest Dyson — Va.
Julius Richard Earle, Jr. — D.C.
Thornton Hagert
William Charles Howlin
Ronald Dexter McGehee
Kenneth Leigh McMahill
Charles Leonard Padgett, Jr.
Don Hilliard Rowe
Robert Charles Vandevort
John Alton White
John Thurston Wright, Jr.

June 6, 1962

Lawrence Boyd Anderson — Utah
Stover Lee Babcock, Jr. — Va.
Neal Barnett Berryman — D.C.
Louie Pauline Blunda — D.C.
John Robert Caracciolo — Pa.
Patrick Edwin Clark — Md.
Preston Cole Clark — Md.
Robert Anthony DeLuca — Mass.
Louis DeSimone — Pa.
Philip Anthony Dubina — N.J.
Lawrence Joseph Dupre — Va.
Janet Sue Flocken — D.C
William Der Fong — D.C.
James McCracken Gilfillan, Jr. — Md.
Gordon Sterling Gillis — Maine
Fred Burton Goldman — D.C.
Philip Gross — Pa.
(With distinction)
Michael Hartwell
Joel Roger Hedetniemi
Hsueh-Ling Ma
Bennett Roy Marshall
James Francis McNeil
Koichi Nukaga
John William Greene Ogilvie, Jr.
Ewell Wendell Payne
Michael Joseph Perper
Domenic Piccone
Colson Leroy Richey
Lionel Roland Romero
Fleet Senseman
Stuart Ronald Sklamm
Allan Smith
Martin Stryker
John Anthony Sygiel
Josephine Carmela Valenti
Elizabeth Lucille Vaughan

Master of Arts in Government

October 21, 1961

Richard Clay Brown — N.M.
A.B. in Govt. 1960, The George Washington University
Randall Martin Evanson — Wis.
B.S. in F.S. 1955, Georgetown University
James Lee Fleshell — Conn.
B.S. 1950, U. S. Coast Guard Academy
Paul Julius Hyman — Va.
B.S. 1955, Cornell University
Choog Hoon Kim — Korea
A.B. in Govt. 1958, The George Washington University
Clare Alfred Moelk — Va.
B.B.A. 1958, Penn College
Bruce D. Francis Norton, Jr.
A.B. 1959, State University of New York
Victor Bryan Penuel, Jr.
A.B. 1961, The George Washington University
Mitchel Perrino, Jr.
A.B. 1939, St. John's University
Solomon Gaston Sherman
LL.B. 1955, A.B. 1959, American University
Jeanne Louise Tillotson
B.S. in H.E. 1939, Florida State University
Norbert E. Touchette
B.S. 1958, University of Maryland
John Milton Welty
A.B. 1956, University of Minnesota

February 22, 1962

Lee Jay Cho — Korea
A.B. 1959, Kook Min College
Philip James Hennessey III — Md.
B.S. 1958, Wesleyan University
John Edward Hixon
A.B. 1960, Southwestern at Memphis
Walter Hiroshi Ikeda
A.B. in Govt. 1960, The George Washington University

Tong Jin Kim — D.C.
A.B. 1958, College of Emporia

Rachel Hultman Loisel — Nebr.
B.S. 1944, Northwestern University

Judith Ann Schwartz — Ohio
A.B. 1960, Cornell University

Daniel Buckley Austin Sobrio — Nev.
A.B. 1960, University of Nevada

Patricia Ann Thompson — Calif.
A.B. 1958, San Francisco State College

JUNE 6, 1962

Mary Sue Bogucki — Md.
A.B. 1950, University of Washington

Robert Martin Brown — Fla.
A.B. 1957, Hobart College

Douglas Lowell Cole — Wash.
A.B. 1960, Whitman College

David Allan Crain — Kans.
A.B. 1960, Kansas State College of Pittsburgh

Sanford Leonard Gold — N.Y.
A.B. 1957, University of Rochester

Francisco deAssis Grieco — Brazil
A.B. 1961, The George Washington University

Ding-Yih Liu — China
A.B. 1953, National Taiwan University

Harold Arthur Paulsen, Jr. — Nebr.
B.S. 1949, U. S. Coast Guard Academy

Leonard B. Pouliot — Va.
A.B. 1949, Mexico City College

Hikmet Sengenc — Turkey
License 1954, University of Istanbul, Turkey
Doctor's Deg. Course 1957, University of Madrid, Spain

Edward Franklyn Shrader — Va.
A.B. 1940, Randolph-Macon College
S.T.B. 1943, Westminster Theological Seminary

Nathan William Stiewig — Va.
B.S. 1949, University of Oregon

Thomas C. Varley — Va.
A.B. in Govt. 1960, The George Washington University

David Earl Walker — La.
B.S. 1960, Louisiana State University and Agricultural and Mechanical College

Leon Carr Watkins — D.C.
A.B. 1957, Johnson C. Smith University

George Raymond Womeldorf, Jr. — D.C.
A.B. 1952, The George Washington University
B.D. 1955, Union Theological Seminary

MASTER OF BUSINESS ADMINISTRATION

OCTOBER 21, 1961

Thomas George Bee — W.Va.
B.S. 1948, Purdue University

William Henry Blake, Jr. — Mo.
A.B. in Govt. 1960, The George Washington University

Charles Edward Buckingham — N.Y.
B.S. 1946, U. S. Military Academy

Calvin G. Covell — Va.
B.S. in M.E. 1959, University of Michigan

John Babtist Dee, Jr. — Colo.
B.S. 1942, Polytechnic College of Engineering, Calif.

John Adam Doerr — Fla.
A.B. 1951, Principia College

William Edward Dulion — Fla.
B.S. in Ind.E. 1940, Alabama Polytechnic Institute

David Michael Dunham — Mo.
B.S. 1947, U. S. Military Academy

Howard Preston Goodson — Texas
B.B.A. 1949, Southern Methodist University

Robert Donald Smith Gregor — Fla.
A.B. 1949, Amherst College

Stanley Hagler — Va.
B.S. in I.E. 1956, Pennsylvania State University

Andrew Jackson Hendrick — Texas
B.S. 1941, Texas Agricultural and Mechanical College

Robert James Holbrook — Md.
B.S. in E.E. 1935, Syracuse University

Wilson Willieburt Johnson — Calif.
B.G.Ed. 1958, University of Omaha

Robert Jerome Keleher — Conn.
B.S. in B.A. 1950, University of Denver

Everett Lee Morris, Jr. — Ala.
B.S. 1948, Athens College

James Thomas Murphy — Mont.
B.S. 1947, University of Utah

James Ernest Paschall — Fla.
B.S. 1946, U. S. Military Academy

Donald Edward Pickett — N.Y.
B.S. 1950, University of Rochester

John Wendell Roberts — Minn.
B.S. 1942, Mankato State College

Thomas William Rowlette — Md.
B.S. in B.A. 1958, Georgetown University

Donald Jack Seed — Kans.
B.S. 1957, Florida Southern College

Oliver Wendell Smith — Ala.
B.S. in B.A. 1960, Alabama State College, Jacksonville

William Parkhurst Smith, Jr. — Md.
A.B. in Govt. 1953, The George Washington University

Loren James Spencer — Idaho
B.S. 1960, University of Maryland

William H. Wise, Sr. — Ala.
B.S. 1957, University of Maryland

Jack Zwick — Ill.
A.B. 1959, Harvard University

FEBRUARY 22, 1962

Charles Erden Bechtel — D.C.
A.B. in Govt. 1956, The George Washington University

Ronald D. Brown — Md.
B.S. 1949, Oregon State College

George William Everett — Va.
B.S. in Mil.Sc. 1958, University of Maryland

Donald Laird Felker — Va.
A.B. 1954, Michigan State College

James Thomas Greenwood — Va.
B.S. 1954, Pennsylvania State University
LL.B. 1959, The George Washington University

Herbert Arthur Hincks — Md.
B.S. 1953, U. S. Naval Academy

James Elmer Merla — Md.
B.S. 1954, University of Maryland

Sherman Leman Miner — Va.
B.S. in B.A. 1941, Kent State University

Shirishkumar Chandulal Pathak — India
A.B. 1957, Gutarat University, India
A.M. 1959, American University

Joseph Van Sterling — Md.
B.S. 1950, Loyola College

Robert James Allen — Calif.
A.B. 1951, San Jose State College

Emmett Richard Arnold — Tenn.
B.S. in Mil.Sc. 1960, University of Maryland

Julian Gordon Bass, Jr. — Fla.
A.B. 1961, The George Washington University

Marvin Hamilton Baugh — Md.
B.S. in Comm. 1947, Texas Christian University

Paul Oliver Becker — N.Y.
A.B. 1953, Ohio Wesleyan University

Norman Franklin Board — Md.
B.S. in B.A. 1956, Virginia Polytechnic Institute

Henry Paul Bunting — Va.
B.S. 1950, New York University

Robert Malcolm Carr — N.Y.
B.S. 1956, A.M. 1957, Columbia University

Norman Clyde Crews, Jr. — Fla.
B.S. 1959, University of Florida

Richard Ellis Crumb — N.Y.
A.B. in Govt. 1958, The George Washington University

Wallace Myron Dow — D.C.
B.S. in B.A. 1954, LL.B. 1957, State University of South Dakota

Carl Wilbur Easton — Va.
A.B. in Govt. 1958, The George Washington University

Robert Gerald Fabian — Pa.
A.B. 1946, Pennsylvania State University

Richard Chester Fay — Md.
B.S. 1944, U. S. Naval Academy
Nav.Eng. 1950, Massachusetts Institute of Technology

Lionel Fernandez — D.C.
A.B. 1955, Queens College

Robert Dean Fisher — Iowa
B.S. 1946, Northwestern University

Robert Joseph Forsyth — N.Y.
A.B. 1951, Villanova University

Robert Lee Ghormley, Jr. — Md.
B.S. 1948, U. S. Naval Academy

Donald Edward Gilman — N.J.
B.S. 1946, U. S. Naval Academy

William John Gleason — N.Y.
B.S. in Mil.Sc. 1959, University of Maryland

Travis Glenn — Md
A.B., A.M. 1951, Butler University

Zoila Gorum y Morales — Philippines
B.S. in Comm. 1949, Far Eastern University of the Philippines

Charles William Bruce Gravett — Canada
B.S. 1957, St. Francis Xavier University, Nova Scotia

Jean Ellen Gwinn — D.C.
A.B. 1957, Duke University

Amelia P. Halili — Philippines
B.B.A. 1958, University of the East, Philippines

Jack Logan Hancock — Pa.
A.B. 1952, West Virginia University

Walter Gerald Harden — Ind.
B.S. 1960, San Francisco State College

Dorothy May Harms — Va
B.S. 1950, New York University

Makoto Hatanaka — Japan
B.S. in Acct. 1960, St. Francis College

Richard Graham Hill — Ill.
A.B. 1960, Augustana College

Leonard Pyrle Hofer — Ohio
B.S. 1950, South Dakota State University

Claude James Holloway, Jr. — Md.
A.B. 1959, Washington College

Robert Gerard Iverson — Wash.
B.S. 1945, U. S. Naval Academy
Nav.Eng. 1952, Massachusetts Institute of Technology

Henry Robert Jones — Va.
B.S. 1953, University of North Carolina

Joseph Francis Jones — Pa.
B.S. 1952, Mount St. Mary's College

Theodore I. Jongerius — Canada
A.B. 1958, Western Ontario University

Keith William Jongeward — N.D.
B.S. in B.A. 1946, Northwestern University

Norman M. Karshmer — Md.
A.B. 1960, University of South Carolina

Joel Tilford Kass — D
B.S. 1959, Roosevelt University

Steven King Kauffman — Va.
B.S. in M.E. 1948, Tufts University
B.C.E. 1953, Richmond Professional Institute

Bronston Shelby Kenney, Jr. — Va
A.B. 1938, Davidson College

Frederick Joseph Kessler — N.J.
B.S. 1956, Boston College

Richard Joseph Knapp — N.J.
B.S. 1951, U. S. Coast Guard Academy

Robert Wayne Lally — N.J.
B.S. 1954, San Francisco State College

Walter Eugene Linthicum — Kans.
B.S. in B.A. 1948, University of Kansas

Robert John Lyons — N.J.
B.S. 1951, St. Peter's College

Francis Joseph Malerich — Calif.
B.S. 1948, North Dakota State Teachers College, Dickenson

Otto Barnhart Martinson, Jr. — D.C.
A.B. 1960, The George Washington University

Emiddio N. Massa — Pa
A.B. 1959, The George Washington University

John Norbert McCabe — Calif.
A.B. 1946, Tufts University

James Deasy McGough — Pa
B.S. 1959, University of Maryland

Theodore Milkovich — Md
B.B.A. 1956, University of Pittsburgh

Leonard Joseph Muller — Ill
B.B.A. 1960, University of Notre Dame

Douglas Yates Munnikhuysen — R.I.
B.S. 1943, U. S. Naval Academy

David Arnold Musgrave — Md
B.S. 1949, Syracuse University

John Clinton Nesbitt — Md.
B.S. 1954, Arizona State University

William Axel Parker — Va
B.S. 1945, University of Illinois
M.P.H. 1950, University of California

Stephen Polaschik — Md
A.B. in Govt. 1954, The George Washington University

Andrew Joseph Potts — D.C.
A.B. 1960, The George Washington University

Alvin Michael Powers — D.C.
B.S. 1956, D. C. Teachers College

George Morgan Rankin, Jr. — Md
A.B. 1958, The George Washington University

Dinker Shankerlal Raval — India
A.B. 1957, Gujarat University, India
A.M. 1959, American University

John Francis Regan — D.C.
B.S. 1939, Harvard University

George LeRoy Reynolds — D C
B.S. 1955, University of Alabama

Daniel Gaeton Richardi, Jr. — N J
B.S. 1960, Monmouth College

Keith Doyle Ripley — Va
B.S. 1957, U. S. Coast Guard Academy

Clarence B. Rogers, Jr. — Md.
A.B. 1951, Gettysburg College

Fernando Sosa Rojo — Texas
B.S. in Mil.Sc. 1955, University of Maryland

Winton Douglas Ross — Md.
B.S. in Pub. Adm. 1939, University of Southern California
Louis Pasquale Rossi
B.S. 1946, U. S. Naval Academy
Hari Ranjan Sarbabidya — India
A.B. 1946, Allahabad University
A.M. 1950, Calcutta University
Wayne Norwood Schelle — Md.
A.B. 1958, Johns Hopkins University
Cassius Clifford Scott — Ohio
A.B. 1961, University of Alabama
Donald Lee Sellers — Oreg.
B.S. 1951, Lewis and Clark College
Otto George Spamer, Jr. — N.Y.
A.B. 1956, Fordham University
David Starr — N.Y.
A.B. 1939, Brooklyn College
Orlando Stallings — N.C.
B.S. 1960, Long Island University
Robert Rountree Strott — Md.
B.S. in B.A. 1954, Loyola College
Alfred Herman Teichler, Jr. — Ohio
A.B. 1946, University of North Carolina
Thomas Clark Thayer — Va.
A.B. 1957, Stanford University
Ramiro Walker — Panama
B.S. in Comm. 1960, Universidad de Panama
James Parker Ward — D.C.
B.S. in B.A. 1953, University of Nebraska
Robert F. Wenzel — N.Y.
B.S. in Pub. Adm. 1958, University of Southern California
Frank Dolan Whalen — Va.
B.S. 1938, U. S. Naval Academy
Robert Leon Wheatley — Md.
A.B. in Govt. 1959, The George Washington University
Edward Arthur Wilcox — Calif.
A.B. 1957, University of Maryland
Robert Wolozin — D.C.
A.B. in Govt. 1952, The George Washington University
Noel Woodley — Texas
B.S. 1941, West Texas State College

Doctor of Business Administration

October 21, 1961

Robert A. Kaye — Va.
A.B. in Govt. 1948, A.M. in Govt. 1950, The George Washington University
Dissertation: "A Study of Export Trade Management Policy of Selected Manufacturing Firms"

THE COLLEGE OF GENERAL STUDIES

Associate in Arts

October 21, 1961

Alfred F. Birra — N.J.
(With distinction)
James P. Carberry, Jr. — Md.
Ella Farran Haare — Va.
Sartorel C. Hardinger — Va.
Charles Auburn Holston — Md
George A. Krumm — Ariz.
Edwin E. Shellett — Texas
Elias Van Krugel — Ala.
Va.
Pa.

February 22, 1962

William Ralph Bell — Ga.
(With distinction)
Keith Albert Bieschke — Ernest Peter Krajeski — Pa.
(With distinction)
Walter Bogor — Iowa
William Hendrie Byrd, Jr. — Md
John Charles Carson, Sr. — Va
Leonard Jack Fischer — S.C.
Gustave Edward Gomory — Va.
Robert Henry LaCoy — Mich.
William Ellis Marlin — Mo.
James Ivan Myers — Md.
(With distinction)
James Wymore Welch — Nebr.

June 6, 1962

William H. Anderson, Jr. — R.I.
Harry Joyce Burkert, Jr. — Va.
Michael Frances Carrick — Va.
Edna May D. Curran — D.C.
John A. Duncan — D.C.
(With distinction)
Joseph John Giampietraro, Sr. — Va.
Charles Norman Goodale — Mass.
(With distinction)
Wade D. Hall — Va.
Frank James Harmon — N.H.
John Alton Holley — Texas
Howard F. Kurtz — Ala.
Joseph Wallace Moore — N.Y.
Louis Emery Pelletier — Maine
Joseph Lomax Powell — Ala.
Martha Parke Shorey — D.C.
Edward Patrick Smith — D.C.
Bernard R. Thenault — Mass.
Roy M. Wade — Va.
Lizberry Waters, Jr. — Va.
Arthur Meredith Williamson — Mass.

Associate in Science

October 21, 1961

Donald Earle Dearborn — Md.

June 6, 1962

Charles Wesley Brown, Jr. — Md.

Bachelor of Arts

October 21, 1961

Daniel Stewart Alexander — Va.
Marion Allen Atwell — Md.
Dwight Bennett Dickson — Ark.
Carroll Harris Donnell — Pa.
Joseph Feith — Ark.
William Russell Furrey — Tenn.
Francis J. Girard — Ill.
Guiher Gene Greenwood — Fla.
Hobert Herman Hoover — W.Va.
George Alexandric Jacob — N.Y.
Maurice S. Lewis, Jr. — Texas
John Desmond Longhill — Tenn.
Allen Joseph MacGill III
Gerald Lee McManis
Donald Wentworth Osgood
Albert Pierson
James Frederick Price
Reaford Leroy Robinson
Bob John Robison
William Adalbert Sinko
Juan Bautista Sotomayor
James Clinton Tarkenton, Jr.
Peter Hendrik Benjamin VanTol, Jr.
Richard Henry Weber

February 22, 1962

Fred Richard Bahr — Calif.
Walter Irvin Berlin — Md.
Keith Albert Bieschke — Iowa
Carl Crowder Burgess — N.C.
Norman Marion Crowder — Calif.
Roger Elson Graves — Va.
Charles Oliver Hiett — Texas
Rex VanLier Hoffman, Jr. — Pa.
John Clifton Honea, Jr. — Texas
(With distinction)
Wilbur Ervin Norris Keil
George William Kenna — Minn.
Jerry Kohout — Mass.
William George Madill, Jr. — Ill.
Mich.
Raymond John Manhart
John Joseph McIntyre
Paul Ammon Morton
John K. Parker
(With distinction)
Edward Kristian Pedersen
Charles Augustus Pendlyshok
Alexander Walter Piotrowski
Gilbert Ross Shacklette
Paul Gerard Swope
Edwin Kenneth Trainor
Lena Sarah Williams
Waldron John Winter

June 6, 1962

George William Adair — Ill.
Paul Philemon Bennett, Jr. — Pa.
James Lucien Berard — Va.
Daniel Bowanko — Va.
Titus Branchi — Va.
John Willoughby Brown — Va.
Richard Renato Burritt — Ill.
James Paschal Carberry, Jr. — Va.
Edgar Glenn Conner, Jr. — Va.
Otis Wesley Corman — Ill.
William Eugene Cross, Jr. — Calif.
William Harold Ellis — Ohio
Maurice E. Esch — Ill.
James August Feliton — N.Y.
John Michael Frank — N.Y.
Thomas Holt Griffin — Calif.
Leonard Hammer — Va.
George Keith Hansen — Nebr.
Stanford Cleveland Hardinger — Ariz.
William Thomas Henderson — Ohio
Hubert Broughton Herring — Ohio
Dan Allen Hodges — Va.
Earmon Roy Jones, Jr. — Ga.
Robert August Kohler — Md.
Lycurgus Clinton Koontz — Va.
Clifford Vincent Kovarik — Md.
(With distinction)
William Rutherford Kreitzer — D.C.
Frederick James Kroesen, Jr.
George Albert Krumm
(With distinction)
Robert Vincent L'Italien
Robert William McInnis
Glenn Carlyle Michel
Lawrence L. Newhouse
Richard Earl Oderwald
Dora Lassiter Perry
Gabriel Lewis Petre
Donald Baldwin Quintero
Curtis Burnard Robinson
Jesse Gladstone Ross
Gerard Augustine Sartori
Santo Phillip Saverino
James Byron Scherer
Robert Marion Sherwood
Edwin E. Shifflett
Talma Robert Smith
Ralph Howard Spanjer
Alvis Henry Stephens
Robert Joe Thomas
Andrew Adolph Tonkovic
Perry Wheeler Ustick
Joseph Francis Walters
Rosemary Joan Willoughby
James Robert Zeitvogel

Bachelor of Science in Cartography

June 6, 1962

Robert Harold Hanson — Md.

Master of Arts

October 21, 1961

Gregory Alexander — Va.
B.S. in Ed. 1952, Ohio State University

Peter J. Athenbrenner — Nebr.
B.S. in Comm. 1938, University of North Dakota

Frances Joan Blake — Va.
B.S. 1952, Nazareth College

John Norman Borini — Calif.
A.B. 1942, B.S. 1948, University of California

Norman Shadrach Chase — R.I.
B.S. 1941, University of Rhode Island

Delavan Carlos Cloe — Va.
A.B. 1935, Harvard University

William Watson Dailey — Ala.
B.S. 1950, Auburn University

Francis J. Girard — Ill.

Elizabeth Stafford Greene — W.Va.
A.B., B.S. in Ed. 1950, Concord College

Patricia Anne Hayes — Ill.
A.B. 1942, College of St. Teresa
B.S. in Mil.Sc. 1956, University of Maryland

Alfred Paul Hobrecht — Texas
A.B. 1941, Texas Agricultural and Mechanical College

William Edward Kinsella — Ohio
B.B.A. 1956, University of Pittsburgh

Robert Joseph O'Malley — Mass.
A.B. 1956, Syracuse University

Carl J. Merck — Va.
A.B. 1948, West Virginia University

DeWitt McDougal Patterson — Md.
B.S. 1939, U. S. Naval Academy

Frank Penland — Va.
B.S. in Ed. 1938, Western Carolina College

Marvin Jean Powers — D.C.
B.S. 1957, University of Kentucky

Delos E. Richard — Ark.
B.B.A. 1949, University of Mississippi

Stanley Hammond Shaw — Ind.
A.B. 1939, Montana State University
LL.B. 1950, Loyola University

Frances Rice Shute — Mich.
A.B. 1960, The George Washington University

[illegible] Sloman — Del.
B.S. in Ed. 1954, University of Delaware

Juan Bautista Sotomayor — Okla.

[illegible] Warner — Va.
A.B. 1949, New Jersey State College, Montclair

February 22, 1962

Aaron Cummings Adkins — Va.
B.S. in Ed. 1957, University of Georgia

William Tallman Benson — Pa.
B.S. 1951, U. S. Merchant Marine Academy

LaVell Meldrum Bigelow — Utah
B.S. 1959, Brigham Young University

Richard Alan Brown — Calif.
B.S. in Mil.Sc. 1959, University of Maryland

Maurice Daniel Callahan — Ill.
B.S.C. 1940, St. Louis University

Edward Francis Callanan — N.J.
B.S. 1948, U. S. Military Academy

William Robert Carnahan — Texas
B.S. 1955, University of Buffalo

Bernard George Carroll — Calif.
B.B.A. 1957, Hofstra College

David Robert Coggins — N.J.
B.S. 1947, Clemson Agricultural College

Robert Lee Dean — D.C.
A.B. 1950, Geneva College

Bernard Marien Engleberg — Md.
A.B. 1960, The George Washington University

Marguerite Charlotte Finnerty — Va.
A.B. 1956, San Francisco State College

Robert Lance Fodrey — Va.
B.S. 1957, College of William and Mary

Leo Edward Furtwangler — Ill.
B.S.C. 1941, University of Alabama

Donn Rodney GrandPré — W.Va.
B.S. 1955, Dickinson College

Vernon Edward Greene — W.Va.
B.S. 1950, Concord College
Ed.M. 1953, Ohio University

George Howard Groff — Pa.
A.B. 1936, Catawba College

Ralph Edward Hazen — Pa.
B.B.A. 1960, College of William and Mary

William Woodrow Hunter — Iowa
B.S. in Mil.Sc. 1959, University of Maryland

Sarah Evelyn Koestline — Fla.
B.S. in Bus.Ed. 1950, Florida Southern College

Thomas Viggers Murto, Jr. — Pa.
B.S. in M.E. 1939, Lehigh University

John Secrist Oller, Jr. — Pa.
B.S. 1941, Franklin and Marshall College

Gerald Felix Russell — R.I.
B.S. 1940, Boston College

Henry Simon — N.J.
B.S. 1948, Rutgers University

William Garnett Steffey — Va.
B.S. in Ch.E. 1937, University of Tennessee

Charles Beman Stevenson — Ohio
A.B. 1960, The George Washington University

Lloyd Alfred Thomas — Va.
B.S. in Ed. 1954, University of Kansas

Charles John Toma — Ohio
A.B. 1939, University of Dubuque

Albert Voges Towns — Texas
B.B.A. 1942, Texas College of Arts and Industries

Eugene Walton White — Wash.
B.S. in Mil.Sc. 1960, University of Maryland

John Whitelaw, Jr. — Md.
A.B. 1949, Tusculum College

Edward Peter Wyruchowski, Jr. — Texas
B.S. 1947, Massachusetts Institute of Technology

June 6, 1962

Margaret Rugh Smith Anderson — Ohio
A.B. 1940, University of Southern California

James Franklin Armistead — Va.
B.M.E. 1958, University of Virginia

William Joseph Aston — Pa.
B.S. 1951, U. S. Naval Academy

John James Delaney — D.C.
A.B. 1954, King's College

Eugene Thomas Dolan — N.Y.
B.S. in Naval Sc. 1952, Villanova University

William A. Faucett — Del.
B.S. 1945, U. S. Naval Academy

Dee Nelson Fitch — Colo.
B.S. in B.A. 1956, University of Denver

Charles Douglas Fredrick — N.J.
B.S. 1942, Lambuth College

Charles Henry Galligan, Jr. — Mass.
B.Mgt.Eng. 1951, Rensselaer Polytechnic Institute

George Francis Gebhardt — N.D.
B.S. in Mil.Sc. 1958, University of Maryland
Alvin Bernard Ginsburg — N.J.
B.S. in M.E. 1956, Newark College of Engineering
Roscoe Harris Goodell — Pa.
B.S. in Mil.Sc. 1959, University of Maryland
James Barton Hardgrave, Sr. — Tenn.
B.S. 1950, Memphis State University
Jack L. Haygood — Ind.
B.S. in Mil.Sc. 1958, University of Maryland
Grady Lee Hicks, Jr. — Mo.
A.B. 1943, University of Missouri
Joseph Paul Hoar — Mass.
B.S. 1956, Tufts University
Earmon Roy Jones, Jr. — Ga.
Ronald Matthias Lauber — Ohio
B.S. in B.A. 1953, Bowling Green State University
Walter Richard Lewison — Conn.
A.B. 1958, The George Washington University
Harry Fraser MacKay — Wash.
B.S. in C.E. 1939, Oregon State College
William Howard Maddox, Jr. — Va.
A.B. 1951, Wofford College
Ivan Coates McLean — Pa.
A.B. 1955, University of Pennsylvania
Bryan Burdette Mitchell — Va.
B.S. in Textile Eng. 1941, Georgia Institute of Technology
George Frederick Monsarrat — Tenn.
B.S. in B.A. 1958, Kansas State University of Agriculture and Applied Science
Richard Archibald Montfort — N.Y.
B.C.S. 1949, Drake University
William Charles Mooney, Jr. — Conn.
A.B. 1956, University of Connecticut
Martin Emil William Oelrich — Neb.
A.B. 1939, University of Nebraska
Gardner Thiele Pierce — Va.
B.Gen.Ed. 1960, University of Omaha
John Polanskey, Jr. — Pa.
A.B. 1958, The George Washington University
John Gerald Redmond — N.Y.
B.S. 1960, University of California at Los Angeles
Kenneth Lyle Reuter — Wash.
B.C.S. 1950, University of Georgia
Walter Julius Rozanus — N.H.
B.S. in Mil.Sc. 1956, University of Maryland
Clarence Leonard Slayman — Md.
A.B. 1938, Western Maryland College
Lee William Spitler — Mich.
B.S. 1956, University of Maryland
Lewis Cass Street III — Pa.
B.S. in Mil.Sc. 1959, University of Maryland
Ivan Lee Swope — Fla.
B.S. 1940, Baker University
Earl Adam Traser, Jr. — N.J.
B.S. in B.A. 1959, Ohio State University
Lewis Frederick Treleaven — Ohio
A.B. 1941, Kenyon College
Herbert Edsel Whyte — S.D.
B.S. 1946, U. S. Naval Academy
David Geary Willingham — Va.
B.S. 1958, U. S. Naval Academy
Robert James Wilson — Va.
A.B. 1937, Western State College, Colo.

Master of Arts in International Affairs

October 21, 1961

Stuart McCall Abrams — Okla.
B.S. 1942, University of Oklahoma
Earl Clyde Acuff — Idaho
B.S. in Ed. 1941, University of Idaho
Andrew A. Aines — Mass.
B.B.A. 1947, Boston University
M.S. 1954, University of Maryland
Urey Woodson Alexander — Ky.
B.S. 1946, U. S. Military Academy
John Wendhrop Armstrong — Fla.
B.S. 1943, U. S. Military Academy
Jerome Lyon Ashcraft, Jr. — Md.
B.S. 1943, U. S. Naval Academy
John Harold Barnes — N.J.
Bach. of Accounts 1938, Rider College
William Stanley Barrett — N.Y.
B.S. 1959, Cornell University
Richard Randolph Bell — Va.
B.S. 1948, Wofford College
B.D. 1951, Emory University
Howard Beard Benge — Pa.
B.S. 1958, U. S. Naval Academy
James Allen Betts — Pa.
B.S. 1943, U. S. Military Academy
M.S. in C.E. 1948, State University of Iowa
Douglas King Blue — N.Y.
B.S. in C.E. 1939, Union College
B.S. 1943, U. S. Military Academy
M.S. in C.E. 1948, California Institute of Technology
Joffre Haig Boston — Va.
A.B. 1942, Western Kentucky State College
Matt Combes Cavenaugh Bristol, Jr. — Texas
B.S. 1939, U. S. Military Academy
William David Brodbeck — Nebr.
B.S. 1953, Municipal University of Omaha
Robert L. Brooks, Jr. — Va.
B.S. 1935, Virginia Polytechnic Institute
Melvin Charles Brown — Mo.
B.S. 1938, U. S. Military Academy
Thomas Wilson Brown — Ariz.
B.S. 1943, U. S. Military Academy
Page H. Brownfield — Okla.
A.B. 1937, Western Kentucky State College
Edward Cooper Bruce — Fla.
B.S. 1942, Oklahoma State University of Agriculture and Applied Science
M.S. 1948, Texas Agricultural and Mechanical College
LeRoy D. Brummitt — Alaska
B.S. 1960, University of Maryland
Jerry G. Capka — Ill.
B.S. 1944, U. S. Military Academy
M.S. in C.E. 1954, Harvard University
George Francis Carter — Calif.
B.S. 1939, St. Mary's College
Jack Edward Carter — N.C.
B.G.Ed. 1957, Municipal University of Omaha
Stephen E. Cavanaugh, Jr. — Calif.
A.B. 1956, University of California at Los Angeles
Thomas J. Cleary, Jr. — Pa.
B.S. 1941, U. S. Military Academy
Robert H. Cole — Wyo.
B.S. in C.E. 1931, University of Wyoming
Charlie Calhoun Coleman — Ga.
B.S. 1942, U. S. Military Academy
Walter Francis Cornell — Va.
B.S. 1940, University of Virginia
Hubert Summers Cunningham — Oreg.
M.B.A. 1957, Harvard University
Charles E. Curran, Jr. — Ill.
B.S. 1942, University of Illinois
Howard Miller Dailey — S.D.
B.S. 1941, South Dakota State College of Agriculture and Mechanic Arts
Robert James Davenport — Neb.
B.S. 1943, U. S. Military Academy
Murray Dean Dougan — Md.
B.S. in I.Ch. 1938, Kansas State University
Donald Dean Dunlop — Iowa
A.B. 1941, Coe College

Howard Deane Elliott — Utah
B.S. 1943, U. S. Military Academy
M.S. 1948, University of Chicago

Gibson Reynolds Finley — Fla.
B.A.E. 1941, University of Florida

James Vance Galloway — Ohio
B.S. in Com. 1940, Ohio University

Billy Burris Geery — Kans.
B.S. in C.E. 1941, Kansas State College of Agriculture and Applied Science

Edwin Cooper Gibson — Ill.
A.B. 1936, University of Wisconsin

Hubert Walter Gillespie — Texas
B.S. 1941, Texas Agricultural and Mechanical College

George Arthur Godding — Fla.
B.S. 1951, University of Maryland

Seymour Louis Goldberg — Md.
LL.B. 1941, American University

Neil James Graham — Texas
B.S. in Mil.Sc. 1959, University of Maryland

Kenrick Wadsworth Hackett — Va.
B.S. 1932, Harvard University

William Walter Harvey, Jr. — Mo.
B.S. 1942, University of Missouri

Jack Garland Hines — Texas
B.S. in E.E. 1949, Texas Agricultural and Mechanical College

Carl William Hoffman — Iowa
B.Mus.Ed. 1942, Drake University

Charles Chilton Holbrook — Md.
B.S. in C.E. 1939, University of Maryland
M.E.A. 1960, The George Washington University

Richard Logan Irby — Va.
B.S. in C.E. 1939, Virginia Military Institute

Thornton Ennells Ireland — Md.
A.B. 1951, University of California

James Curtis Jeffries, Jr. — Ark.
B.S. 1939, Mississippi State College

Gordon Melville Johnson — Ariz.
B.S. 1950, New York University

Charles Myers Jones, Jr. — N.J.
B.S. 1943, U. S. Military Academy
M.S. 1950, Johns Hopkins University

Linwood Fogg Jordan — R.I.
B.S. 1942, U. S. Military Academy

James George Kalergis — Mass.
B.S. 1938, Boston University

Samuel Nairn Karrick, Jr. — Calif.
B.S. 1943, U. S. Military Academy

Maurice Wesley Kendall — Ind.
B.S. 1942, Indiana University

Leo Douglas Kinnard — N.J.
B.S. 1944, U. S. Military Academy
M.S. 1957, Princeton University

Malcolm Kullmar — Fla.
A.B. 1940, Western Maryland College

David M. Kyle — Oreg.
B.S. 1942, Oregon State College

Weldon Emanuel Laiche — La.
B.S. 1940, Louisiana State University and Agricultural and Mechanical College

John Erwin Lance, Jr. — Tenn.
B.S. in Mil.Sc. 1959, University of Maryland

Harry Bert Lane — Nebr.
B.S. 1940, U. S. Military Academy

Alex Thomas Lauweten, Jr. — Md.
B.S. 1957, University of Maryland

Leon Smith Lawrence — Fla.
B.S. in B.A. 1940, University of Florida

Elmore Grenville Lawton — W.Va.
B.S. 1933, Clemson Agricultural College
M.S. 1948, California Institute of Technology

Richard Joseph Long — Mass.
B.S. 1938, U. S. Military Academy

James Warren Love — Mont.
A.B. 1939, Montana State University

Robert Arnold Martin — Mich.
B.S. 1949, Michigan State University of Agriculture and Applied Science

James Otis Mayo — Miss.
B.S. 1941, Mississippi State College

Robert W. McCartnes — La.
A.B. 1938, Tulane University
B.S. in L.S. 1939, Louisiana State University and Agricultural and Mechanical College

John Joseph McKenna — D.C.
A.B. 1937, Ed.M. 1938, Boston College

Arthur Clayton Meier — Iowa
B.S. 1941, Harvard University

Emil F. Meis, Jr. — Texas
B.S. 1937, University of Oklahoma

Harry Jack Mier, Jr. — Pa.
B.S. 1943, University of Maryland

James Harry Mobley — Ga.
A.B. in Ed. 1949, University of Georgia

James Howell Moore — S.C.
A.B. 1941, Wofford College

James Montgomery Moore — Ariz.
B.S. 1945, U. S. Military Academy

Woodford Tanner Moseley — Ind.
B.S. 1941, Western Kentucky State College
M.S. in I.M. 1957, Georgia Institute of Technology

Reuben Wallis Munds — Texas
A.B. 1909, The George Washington University

John Lunar Murray — N.Y.
LL.B. 1949, New York Law School

John Francis Thomas Murray — N.Y.
B.S. 1941, U. S. Military Academy
LL.B. 1951, Harvard University

Harold Easton Nelson — Ill.
B.S. in C.E. 1946, University of Illinois
M.C.E. 1947, Cornell University

Frank Joseph Nemethy — Wyo.
B.S. 1956, University of Georgia

George Edward Newman — Ala.
B.S. 1946, U. S. Military Academy

Allen Hale Nottingham — Tenn.
B.I.E. 1942, Alabama Polytechnic Institute

Richard James O'Neill — Md.
B.S. 1939, University of Maryland

Norman C. Pardue — Ala.
B.S. in I.E. 1939, University of Alabama
M.B.A. 1947, University of Chicago

Laverne Arthur Parks — Wash.
B.S. 1947, University of Washington
M.B.A. 1952, University of Pennsylvania

Marcus Lindley Parsons — Maine
B.S. 1946, Bowdoin College

Robert Gray Platt — Mich.
A.B. 1939, Michigan State University of Agriculture and Applied Science

Ray L. Porter, Jr. — Ark.
B.S. 1960, Kansas State University of Agriculture and Applied Science

Herb Duane Prather — Colo.
B.G.Ed. 1956, Municipal University of Omaha

Sterline Evans Purnell — Md.
B.E. 1941, Johns Hopkins University

James Lucas Rolfe — W.Va.
B.S. in M.Sc. 1958, University of Maryland

Jacob Lewis Rose, Jr. — Ga.
A.B. 1948, West Virginia University

George Hector Russell — Wash.
A.B. in Ed. 1948, Western Washington College of Education

Louis Schaffer — Texas
M.B.A. 1957, University of Chicago

Albert Dulaney Schultz — Texas
B.S. 1941, Texas Agricultural and Mechanical College

Harold Dorman Seaman — N.J.
A.B. 1944, Colby College

Gerald Hugh Shea — Calif.
A.B. 1941, University of Hawaii

Donald Wilt Shive — Pa.
B.S. 1937, U. S. Military Academy

James Elmer Simmons — Va.
B.S. 1957, University of Maryland

Joseph Warran Sisson, Jr. — Pa.
B.S. 1936, University of Maryland

James Coleman Smee — Nev.
B.S. in Comm. 1938, University of Kentucky
William Elmer Smith — S.C.
B.S. 1941, Clemson Agricultural College
Eduardo Miguel Soler — Puerto Rico
B.S. 1943, U. S. Military Academy
M.S. in E.E. 1956, Georgia Institute of Technology
Charis Roger Sparra — Texas
B.S. 1940, Texas Agricultural and Mechanical College
John Hugh Spears — Colo.
B.S. 1941, New Mexico State University
Donald Calhoun Spiece — Pa.
B.S. 1943, U. S. Military Academy
Charles Lowndes Steel, Jr. — Fla.
B.S. 1944, U. S. Military Academy
M.S. in C.E. 1950, Harvard University
Harry Ami Stella — Ill.
B.S. 1940, U. S. Military Academy
George Ralsey Stevens III — Conn.
B.S. in B.A. 1942, University of New Hampshire
John Bull Stirling — Md.
B.S. in Mil.Sc. 1960, University of Maryland
Harold G. Stover — Pa.
B.S. 1938, Pennsylvania State University
Warren Harding Stutler — W.Va.
A.B. 1942, The Citadel
Alex Garrett Sutton, Jr. — Texas
B.S. 1935, Texas Agricultural and Mechanical College
Thomas Harvey Tarver — Miss.
B.S. 1942, U. S. Military Academy
George Ellsworth Tormoen — Mass.
B.S. 1960, University of Maryland
Ward Hamilton Van Atta — Mich.
B.S. in C.E. 1937, Michigan State University of Agriculture and Applied Science
M.S. 1947, Harvard University
Albert Charles Waldman, Jr. — N.J.
B.S. 1942, U. S. Naval Academy
Marshall Wallach — Va.
B.S. 1939, U. S. Military Academy
Charles William Walson — D.C.
B.S. 1938, U. S. Military Academy
William Patrick Wansboro — N.Y.
B.S. 1938, U. S. Military Academy
Ben Hunt Ward — Tenn.
B.S. in B.A. 1942, University of Tennessee
William Rhinehart Washington — Va.
B.S. 1940, Virginia Polytechnic Institute
Anthony Lewis Paul Wermuth — Pa.
B.S. 1940, U. S. Military Academy
A.M. 1951, Columbia University
John Gray Wheelock III — Ill.
B.S. 1943, U. S. Military Academy
Frederick Grinnell White — Wash.
B.S. 1940, U. S. Military Academy
Stanley Edwin Whitmore — Tenn.
A.B. 1934, Virginia Military Institute
LL.B. 1947, Cumberland University
Leroy Buckman Wilson — Pa.
A.B. 1937, University of Pennsylvania
John Herold Wohner — Miss.
B.S. 1940, U. S. Military Academy

February 22, 1962

Wing Fook Jung — Ga.
B.S. 1940, U. S. Military Academy
Charles Ferdinand Kane — Va.
B.S. in Mil.Sc. 1961, University of Maryland
Pierre Victor Kieffer, Jr. — Fla.
B.S. 1936, U. S. Military Academy
M.S. in C.E. 1948, Massachusetts Institute of Technology
Francis Edward Kramer — Texas
B.S. 1940, U. S. Military Academy
Alton Enoch Parker — Va.
B.S. 1932, U. S. Naval Academy
William Edward Potts — Va.
B.S. 1952, University of Maryland
A.M. in Per.Adm. 1955, The George Washington University
Tonas Arthur Smith — Fla.
A.B. in Govt. 1949, The George Washington University
Patrick Boisseau Watson — Ill.
B.S. 1938, University of Florida

June 6, 1962

John Elliott Arthur, Jr. — Pa.
B.S. 1937, University of Pittsburgh
A.M. 1959, The George Washington University
Olinto Mark Barsanti — Nev.
A.B. 1940, University of Nevada
Richard Traber Batson — Miss.
B.S. 1943, U. S. Military Academy
M.S. in C.E. 1949, California Institute of Technology
Glenn Taylor Beelman — S.D.
B.S. in C.E. 1938, South Dakota State College of Agricultural and Mechanical Arts
Louis Edward Coirn — Pa.
B.S. 1938, U. S. Military Academy
Roy Wheaton Cole, Jr. — R.I.
B.S. 1936, U. S. Military Academy
Charles Newton Crandall, Jr. — N.J.
B.S. 1943, U. S. Naval Academy
Ernest Homer Davis — Ky.
B.S. 1941, University of Kentucky
Frank Armand de Latour — Texas
B.S. 1940, U. S. Military Academy
Thomas Glen Ferguson — Va.
B.S. in Mil.Sc. 1959, University of Utah
Lester Ruthven Ferriss, Jr. — N.Y.
B.S. in Mil.Sc. 1956, University of Maryland
Harry Edward Hagerty, Sr. — N.C.
A.B. 1934, DePauw University
Lloyd E. Hirschhorn — Va.
B.S. in Ed. 1954, Rutgers University
M.B.A. 1960, New York University
Vincent William Howard — Ariz.
B.S. 1962, University of Maryland
George Bernie Jordan — Pa.
B.S. in Agr. 1941, University of Arizona
James Henry King — Fla.
B.S. 1941, U. S. Military Academy
William Ivan King — Pa.
B.S. in B.A. 1942, The Citadel
John Marvin Kinzer — D.C.
B.S. in Agr. 1940, University of Florida
Michael John Kriaman — Ill.
B.S. 1939, U. S. Military Academy
John Charles Kulp, Jr. — Calif.
A.B. 1939, Pennsylvania State University
Jonathan Frederic Ladd — Texas
A.B. 1943, University of Washington
Melvin Martin Lawson — Pa.
B.S. in E.E. 1938, Texas Agricultural and Mechanical College
Edwin C. Lee — Conn.
A.B. 1934, Rutgers University
Charles Dorsey Maynard — Va.
B.S. 1941, U. S. Military Academy
M.S. in C.E. 1947, Harvard University
M.S. 1951, Rensselaer Polytechnic Institute
Thomas McKinley — N.J.
B.S. in B.A. 1947, Georgetown University
Frank Petruzel
B.S. 1961, University of Maryland

George L. Raring — Pa.
B.S. 1932, U. S. Naval Academy
M.S. 1941, Massachusetts Institute of Technology

Anthony Joseph Rose — Ill.
B.S. 1935, University of Illinois

William George Thomas III — N.C.
B.S. in B.A. 1941, Rutgers University

John Fogg Twombly III — N.Y.
B.S. in E.E. 1938, Virginia Military Institute

Robert Trueman Vance — Wash.
B.S. 1937, U. S. Naval Academy

Ben Louis Wechsler — Pa.
B.S. in M.E. 1942, Carnegie Institute of Technology

George P. Winton, Jr. — Fla.
B.S. 1939, U. S. Military Academy

Master of Business Administration

October 21, 1961

Bernice Stone Barr — Texas
A.B. 1948, University of Kansas

Stephen Louis David — Va.
B.S. in F.S. 1953, Georgetown University

Charles Maury DeHority — Ind.
B.S. 1938, U. S. Naval Academy

Kenneth Earl Martin — Pa.
A.B. 1940, University of Wyoming

Thomas Vaughan McEnery — La.
B.S. 1940, Louisiana Polytechnic Institute

James Thomas McGibony — Ga.
B.S. 1950, M.S. 1951, M.D. 1955, Emory University
M.P.H. 1962, Johns Hopkins University

Martin George Megica — Calif.
B.S. 1939, U. S. Military Academy

Riner Champ Payne — Va.
A.B. 1935, Shepherd State College

Wallace Hamilton Robinson, Jr. — Tenn.
B.S. 1940, Virginia Polytechnic Institute

Robert Samuel Salzer — N.Y.
A.B. 1940, Yale University

Donald Francis Slaughter — Utah
A.B. 1938, University of Utah

Donald McIntosh Thompson — Va.
B.S. 1939, Massachusetts Institute of Technology

Charles William Travis — Tenn.
B.S. 1933, U. S. Naval Academy

Henry Brooks Wilson — Pa.
B.S. 1938, U. S. Military Academy

February 22, 1962

Edwin Gregory Beggs — Wash.
B.S. 1936, U. S. Military Academy

George Henry Carter — Va.
B.S.C. 1936, University of North Dakota

Richard E. Figley — Ohio
B.M.E. 1956, Ohio State University

James Wilbur Gilman — Mass.
B.S. 1942, University of Massachusetts

Troy Tillman Guillory — La.
B.S. 1952, Municipal University of Omaha

Daniel Martin Karcher — Pa.
B.S. 1942, U. S. Naval Academy

Roy Vernon Porter — Iowa
A.B. 1934, Coe College

Rex Edward Rader — Ariz.
B.S. 1940, U. S. Naval Academy
M.S. in Aero.Eng. 1947, Massachusetts Institute of Technology

Henry Alfred Rasmussen — N.J.
B.M.E. 1940, University of Minnesota

Emmett Robinson Reynolds — Ala.
B.S. 1943, U. S. Military Academy
M.S. in E.E. 1948, University of Illinois

Ward Wayne Witter — Pa.
B.S. 1944, U. S. Naval Academy
M.S. 1948, Purdue University

June 6, 1962

Earl J. Brown — Pa.
A.B. 1936, University of California at Los Angeles
A.M. in Int. Rel. 1950, Stanford University

William Donaldson Canfield — Wash.
B.S. in Mil.Sc. 1958, University of Maryland

Robert Charles Coats — La.
B.S. in Comm. 1939, Louisiana Polytechnic Institute

Leonard Frank Colwell — Va.
B.S. 1936, New York University

Sydney Gilbert Fisher — Ill.
B.S. 1940, U. S. Military Academy
LL.B. 1949, Harvard University

Robert Olin Fricks — Fla.
A.B. 1951, University of Florida

Peter Angelo Gerardi — Va.
B.C.E. 1938, College of the City of New York
M.C.E. 1940, New York University

Edward August Guilbert — Conn.
Ph.B. 1941, University of Vermont

Thomas Edison Haynes — N.C.
B.M.E. 1941, North Carolina State College of Agriculture and Engineering

James Pollock Jamison — Pa.
B.S. 1941, U. S. Naval Academy
M.S.E. 1950, Johns Hopkins University

Lloyd Earl Johnson, Jr. — Pa.
B.S. 1938, U. S. Military Academy

Charles Lawrence Knight — La.
B.B.A. 1940, Tulane University

Ralph Gordon Leedy — Oreg.
B.S. 1942, U. S. Naval Academy

William McKinney Mantz — Wash.
A.B. 1937, Whitman College

Nathan G. Mehaffey — Va.
B.B.A. 1958, Southern Methodist University

Paul Emil Neff — Va.
B.C.E. 1937, M.C.E. 1938, College of the City of New York

Grant Alexander Palmer, Jr. — Nev.
B.S. 1941, U. S. Naval Academy

Arnold Thielens Phillips — Va.
B.S. in Aero.Eng. 1951, University of Michigan

Albert Pierson — Va.
A.B. 1961, The George Washington University

Richard Thomas Power — Calif.
A.B. 1939, Michigan State University of Agriculture and Applied Science

James Rhoden Pritchard — Fla.
B.S. 1933, U. S. Military Academy

Charles Desarmeaux Pulver — Va.
B.S. 1942, U. S. Naval Academy

William Bruce Sandlin, Jr. — Fla.
B.S. in Mil.Sc. 1961, University of Maryland

Tom Watson Sills — S.C.
A.B. 1929, The Citadel

William Love Starnes — Texas
B.S. 1943, U. S. Military Academy
M.S. in C.E. 1947, Massachusetts Institute of Technology

Donald Morgan Swingle — N.J.
B.S. in Ed. 1943, D. C. Teachers College
M.S. 1947, New York University
A.M. 1948, M.E.S. 1949, Ph.D. 1950, Harvard University

Robert E. Vandenburg
B.S. 1960, University of Maryland

Wilbur John Wehmeyer
A.B. 1936, B.S. in M.E. 1937, State University of Iowa

George Haywood Young, Jr.
B.S. 1942, The Citadel
M.S. in M.E. 1958, University of Southern California

THE GRADUATE COUNCIL

Doctor of Philosophy

February 22, 1962

Aaron Goldbreg — Md.
A.B. 1939, Brooklyn College
M.S. 1954, De Paul University
Dissertation: "The Genus Melochia in America"

Milton Gordon — Md.
A.B. 1950, University of California at Los Angeles
M.S. 1955, The George Washington University
Dissertation: "Studies on the Relationship of Delayed Hypersensitivity to Immunity in Tularemia"

Ronald Grover Kuntzman — Md.
B.S. 1955, Brooklyn College
M.S. 1957, The George Washington University
Dissertation: "Studies on Catecholamines in Nervous Tissue"

James Bryan Pirach — Md.
A.B. 1949, University of Minnesota
M.S. 1952, St. Louis University
Dissertation: "Characteristics of Variola Virus in Tissue Culture"

Howard Richard Roberts — Md.
B.S. 1955, M.S. 1957, The George Washington University
Dissertation: "Some Results in Life Testing Based on Hypercensored Samples from an Exponential Distribution"

Robert Sanford Rozman
B.S. 1955, M.S. 1958, The George Washington University
Dissertation: "Studies on the Reaction of Bis-β-Chloroethyl Sulfide with Purines, Pyrimidines, and Polynucleotides"

Archibald Johnson Sampson
A.B. 1934, Stanford University
A.M. 1946, The University of California at Los Angeles
Dissertation: "Forging Democracy in Malaya"

James Blake Thomas
A.B. 1952, Wabash College
M.S. 1958, The George Washington University
Dissertation: "Abnormal Development of the Early Chick Embryo Due to Influenza A Virus: An Histochemical Analysis"

George Henry Wirtz
B.S. 1953, M.S. 1956, University of Wisconsin
Dissertation: "Some Biochemical Studies of the First Component of Complement"

Bertie Harold Reginald Woolf
A.B. 1955, A.M. 1957, The George Washington University
Dissertation: "Facilitation and Interference in Concept Formation"

June 6, 1962

Cyrus Robbins Creveling — Md.
B.S. 1953, M.S. 1955, The George Washington University
Dissertation: "Studies on Dopamine-β-Oxidase"

Sidney Albert Fine — Md.
B.S.S. 1936, M.S.E. 1941, College of the City of New York
Dissertation: "A Functional Job Analysis as a Method of Indirect Validation A Study in Synthetic Validity"

Walter Andrew Gentner — Md.
A.B. 1951, A.M. 1952, The George Washington University
Dissertation: "The Influence of Ethyl N,N-di-n-Propylthiolcarbamate (EPTC) on Wax Formation in Cabbage"

Janet Waldman Johnson — Va.
A.B. 1951, A.M. 1956, The George Washington University
Dissertation: "An Investigation of Relationships Between College and Senior Student Characteristics and Performance on the Aptitude and Area Tests of Graduate Record Examination at The George Washington University"

Jerome Kern
B.S. 1950, Brooklyn College
M.S. 1953, Ohio State University
Dissertation: "Studies of Hemagglutination by Enteroviruses"

Walter McKay Lovenberg
B.S. 1956, M.S. 1958, Rutgers University
Dissertation: "Studies on the Enzymatic Decarboxylation of Aromatic Amino Acids"

Thomas Elijah Smith
B.S. 1953, Benedict College
M.S. 1959, The George Washington University
Dissertation: "Investigations on the Mechanism of Action and Inhibition of Monoamine Oxidase"

HONORARY DEGREES

February 22, 1962

Eugene Martin Zuckert—*Doctor of Laws*

June 6, 1962

Robert DeBlois Calkins—*Doctor of Laws*
Robert Rowe Gilruth—*Doctor of Science*
Robert Strange McNamara—*Doctor of Public Service*
Marjorie Hope Nicolson—*Doctor of Letters*
Glenn Theodore Seaborg—*Doctor of Public Service*

RECIPIENTS OF AWARDS

1961–62

FELLOWSHIPS

American Security and Trust Company Fellowship: Randall Martin Evanson, B.S. in F.S., A.M. in Govt.

Thomas Alva Edison Fellowship: Mary Alida Holman, A.B., A.M.

National Defense Graduate Fellowships: Ross L. Crow, A.B.; Ingrid Helga Henkels, A.B.; Emilienne Jeanine Hinsberger, A.B.; James Wallace Hutcheson, A.B.; Marlyn Wagener Kern, A.B.; Natalie Frances Lagana, A.B., A.M.; Mary Elshoff Arenas, A.M.; Edwin Bachman, A.B.; Fanchon Chaffee Gerstenberg, A.B.; Margaret Faye Fuqua, A.B.; Barbara Gaffney, A.B.; Beatrice Hauer, A.B.; David Ernest Prowse Johnson, A.B.; Patricia Evans Kreutzer, A.B.; Nancy Carolyn Mustafa, A.B.; Ruta Penkiunas, A.B.; Judith Elizabeth Ringgold, A.B.; Georges Alfred Rouleau, B.S.S.; Herbert Sims, A.B.; Johannus Marinus Spronk, A.B., A.M.

Scottish Rite Fellowships:

California Scottish Rite Fellows of the Consistories of California: Roderic D. Tuttle, A.B.; Ted D. Morse, A.B.; Douglas D. Lottridge, B.S.

Colorado Scottish Rite Fellow of the Consistories of Colorado: John H. Penfold, A.B.

Florida Scottish Rite Fellow of the Jacksonville Consistory: Alice Elizabeth Kaler, A.B.

Florida Scottish Rite Fellow of the Miami Consistory: Jerrold Shenkman, A.B.

Kansas Scottish Rite Fellow of the Fort Scott Consistory: David A. Crain, A.B.

Kansas Scottish Rite Fellow of the Topeka Consistory: Kenton H. Pattie, A.B.

Louisiana Scottish Rite Fellow of the Baton Rouge Consistory: Jared W. Bradley, A.M.

Louisiana Scottish Rite Fellow of the Grand Consistory of Louisiana (New Orleans): David Walker, B.S. in M.E.

Louisiana Scottish Rite Fellow of the Shreveport Consistory: Edward T. Pledger, A.B.

Maryland Scottish Rite Fellow of the Consistories of Maryland: James B. Hendershot, A.B.

Mississippi Scottish Rite Fellows of the Consistories of Mississippi: Charles M. Bacon, A.M.; Jack H. Ewing, Jr., A.B.

Missouri Scottish Rite Fellows of the St. Louis Consistory: Harry F. Finks, A.B.; Jay L. Kanzler, A.B.; Randall W. Meyer, Jr., A.B.

Montana Scottish Rite Fellows of the Consistories of Montana: Robert H. Betzer, A.B.; James Byron Christian, A.B.

Oklahoma Scottish Rite Fellows of the Consistories of Oklahoma: William J. Bonner, A.B.; John H. Marlin, A.B.; Harry W. Readnour, A.B.

South Dakota Scottish Rite Fellow of the Consistories of South Dakota: James C. Randall, A.B.

Texas Scottish Rite Fellows of the Texas Consistories: Charles G. Howard, A.B., James Gaylord Armstrong, A.B.

Washington Scottish Rite Fellow of the Consistories of Washington: Douglas L. Cole, A.B.

Virginia Scottish Rite Fellows of the Consistories of Virginia: Donald R. Woodward, A.B.; John N. Ellison, M.S.; Jerry M. Newman, A.B. in Govt.; Andrew Lloyd Case, A.B.

West Virginia Scottish Rite Fellow of the Consistories of West Virginia: Louis A. Trosch, A.B.

Washington Area School Study Council Fellowship: James Wriley Jacobs, B.S. in P.E., A.M. in Ed.

Wolcott Foundation Scholarships: Allan R. Furman, A.B.; Patricia Reher, A.B.; Robert C. Tadlock, A.B.

For the names of Fellows who serve as Assistants in Research and Instruction, see pages xliii–xlv.

SCHOLARSHIPS

Alumni Scholarships: William B. Benton, Robert T. Levine, John Carroll Quinn, Thomas Robert Robinson, Jeffrey B. Springer, Ann Wendell Thompson
American Foundation for Pharmaceutical Education Scholarships: Sister Anatilia Klodt, Phillip Waple Legg
American Legion Auxiliary Scholarship: Sandra Boorstein
American Society of Women Accountants Scholarship: Rita Rigas
Byron Andrews Scholarship: Eileen Ann Wishner
Anonymous Scholarship: Jack Earl Kundin
Association of Federal Communications Engineers Scholarship: Ivan Stoykov Kavrukov
Avalon Fund Scholarships: Todd E. Anderson, William A. Barclay, J. E. Barrett, Clyde L. Bell, Jr., Betty Bish, Joel D. Brown, Frank M. Buckingham, Terry M. Buxton, Richard L. Carvalho, William H. Dermody, Jr., Peter L. Greenberg, Marcell Jackson, Cecil B. Jacobson, Barbara M. Kadell, Gerald Lazarus, G. Frank Madsen, Jerome S. Mayersak, Norman C. Meyers, Robert W. Rabbitt, James T. Shaw, Sherrill J. Slichter, Eugene H. Sullivan, Richard W. Takaki, Russell Tomar, Egils Veverbrants, Walter S. Yourchek
Anna Bartsch Hospital Intern Scholarship: Carolyn J. Martin (M.D.)
Anna Bartsch Medical Student Scholarship: Betty Bish
Everett Lamont Bradley Scholarship: Francis Gerald LaPiana
Frederick Albert and Alma Hand Britten Scholarships: Austin Stanley Brown, Jr., Frederick Joe Buck, John Richard Calarco, Martin Joseph Costello, Jr., Lawrence Merryman Dennison, Richard Dale Dixon, H. James Garner, Alan Brooke Griest, Charles St. John Herbert III, Martin Roger Hum, Allyn Eric Kilshimer, Joong Suk Lee, Douglas MacDonald, John N. Nemchek, Arthur Thomas Nielsen, Paul Albert Oscar, David Louis Prisaznick, Walter Godfrey Santilli, Richard Thomas Shearer, Irwin Wayne Stanton, Aaron Andrae Suleske
Brooklyn Alumni Scholarship: Sidney Leon Eisenbaum (A.B.)
Emma K. Carr Scholarships: Frederic M. Acker, Carlos Alberto Alonso, Hoyt Sutliff Alverson, Martin J. Gerstein, Stanley Benjamin Holstein, Leslie Allan Hubbard, Ashok Satish Kalelkar, Gary Thomas McIlroy, Martin Vester Reece, Juris Simanis
Henry Harding Carter Scholarship: Howard Thiebau: Hill
Columbian Women Scholarships: Dulcey A. Brown, Barbara J. Englander, Lilien Filipovitch, Kathleen Mach, Sheba Meyers, Carolyn Ann Pickell, Patricia Poindexter, Rose Popovitch, Wanda Rappaport, Sharon A. Ringel, Marlene M. Silverman, Sherrill J. Slichter, Jill L. Warren
Mary Covington Memorial Scholarship: George H. Gerstman
Daughters of the American Revolution Scholarship: Rhoda Baynard Miller
District of Columbia Pharmaceutical Association Scholarship: Carol Ann Frame
Charles Worthington Dorsey Memorial Scholarship: Alvin Capp
Estella Constance Drane Scholarship: Mary E. Mussellman
School of Engineering Scholarships: Gerald Walter Binker, Harvey Joseph Flatt, Philip Bernard Kaplan, Billy R. Lamer, Thomas Elmer McIntosh, Lawrence Joseph Nivert, Morton Frank Taragin, Vytas Albert Tarulis, Louis Paul Wagman
Henry Parsons Erwin Scholarship: Mendel L. Peterson, Jr.
Robert Farnham Scholarship: Freda Ruth Sussman
Esther Brigham Fisher Scholarship: Freda Ruth Sussman
General Motors College Scholarships: John Gorden Day, Gerald Allen Harden, Jacqueline Howell, Joyce Judson Ormsby
Georgetown Business and Professional Woman's Club Scholarship: Maryland Jean Hartge
Giant Food Scholarships: Jay Baraff, Neal Berryman
Grants-in-Aid Scholarships: Joseph J. Adamitis, Donald B. Ardell, Robert W. Armstrong, Philip J. Aruscavage, Robert G. Barnes, Stephen J. Bartnicki, Gordon S. Bennett, Clayton V. Bittinger, Clifford Botyos, William F. Brzezinski, Michael A. Checkan, Thomas E. Chesla, Ronald A. Cindrich, Mark S. Clark, Joseph G. Congiho, James R. Conner, Jr., Warren N. Corbin, Raymond D. Cushman, Louis Desimone, Fred F. Durazio, Ronald E. Droze, Richard Drummond, Richard L. Duenkel, Henry C. Duques, James A. Evans, Edward A. Farrell, Jr., Jon A. Feldman, George A. Ferguson, Paul Flowers, Anthony J. Fredicine, Thomas J. George, Frank Goeltz, Alan S. Green, Arthur H. Gubtosa, Andrew A. Gunda, Leonard B. Gunsior, William D. Hardy, Harvey R. Harrison, Harry H. Haught, Jr., Neil G. Hausig, Joel R. Hedetniemi, Joseph P. Heilman, Michael R. Herron, Merwin W. Holland, Gary F. Holloman, Charles W. Hornfeck, Richard J. Hornfeck, Michael A. Hornyak, James M. Johnson, John F. Kasprzak, Peter B. Krause,

Kenneth E. Legins, Eric A. Lewis, Walter J. Ligenza, Robert J. Lukomski, Robert P. McCormack, Michael R. Maggart, Joseph W. Mullan, John M. Mullen, Paul J. Musser, John J. Papanicolas, William T. Pashe, Robert J. Passeri, Frank B. Pazzaglia, John P. Pilconis, Rudy Pohl, Leon T. Pollock, Charles B. Reed, Anthony Romasco, Seth D. Rosen, Stephen V. Rubin, Frederick W. Ruckert, Jerry Rudy, Edward J. Ruppert, Rudolf F. Russart, Gary G. Scollick, David M. Shearman, Mark F. Sherry, Dan I. Singer, Alexander G. Sokaris, Merrill Solomon, Peter R. Sommer, David P. Sparks, James R. Stiffler, George G. Stone, Jr., Morris J. Sutter, Elliott Swift, Robert M. Tilker, Oliver J. Treibick, James M. Tricolli, Robert M. Watson, John A. White, George B. Williams, Dominic E. Zaccarelli, Rudolph Zieger

Mildred Green Memorial Scholarship: Ella Virginia Carter

Toby Gutwark Scholarship: Judy Hess Posner

Anna Spicker Hampel Scholarship: Wanda Rappaport

Elma Lewis Harvey Scholarship: Isabel Merrick Davies

Hazelton Scholarship: Lilien Filipovitch

High School Scholarships: Carolyn Joyce Brock, Donna Clark, Theodore Cooper, Leland George Dribin, Virginia Dyer, Marvin Feldman, Charlotte Fisher, Allan Bruce Goldberg, Edward Goldman, David Hamilton, Hugh Heclo, R. Gerald Heinze, Lynda L. Hessmann, Verne Jean McCullen, Clark C. Miller, Janice Niblett, Ina May Orwicz, Marie Petersilia, Joseph B. Pincus, Ruth Ellen Rendely, John W. Robinson, Jim Rowsey, Arlene Shapiro, Joel I. Shulman, Arthur J. Sober, Maxine Solomon, Mary Gordon Thom, John W. Tucker, Carole Anne Vaden, Evangeline S. Wells, Mary Ann Wilder

High School Discussion Conference Scholarships: Baruch A. Felner, Faye Gilroy, Dee L. Meek

Kappa Alpha Theta Scholarship: Janice Larkins

Kappa Kappa Gamma Scholarship: Lorraine Meyerovitch

Law School Scholarships: Joseph L. Brand, Shirle Arthur Debenham, John Alfred Erchler, Milton B. Fisher, Lauren E. Hicks, William Hochman, Charles T. Hopkins, John T. Jenkins, Charles N. Johnson, Jonathan Edwin Johnson, Harold F. Kennedy, Robert D. Krumme, Edwin P. Latimer, Linda Kathleen Lee, Robert E. Maher, Charles Marmaros, John G. Quist, Frederick T. Schornhorst, Carl Walter Schwarz, John M. Spurgeon, John Rogers Stafford, Max Volterra

Lederle Laboratories Scholarships: Dwight L. Carlson, Jerome S. Mayersak

Eugene and Agnes E. Meyer Scholarships: Ruth Day Burtnick, Dorothy Sandra Cain, John Lawrence Diesem, Carole Ann Dowd, Barbara Joy Englander, Marilyn June Evans, Jean Marie Gladding, Judith Mary Hoenack, Perry Ingram, Arlene Marian Kevorkian, Sidney W. Lowery, John Kent Minichiello, Janet Eileen Morrissey, Jeanette Murphy, Jean Marian Myers, Helen Vincenza Nitti, Carol Ann M. Nyquist, James Chaney Raff, Jill Linda Warren, Jacque Cedric Young, Jr.

National Institutes of Health Scholarships: Terry Mackley Buxton, Leslie Dornfeld, Gerald Fleischner, Peter L. Greenberg, Martin Horowitz, Joel Koslow, Alfred Karl Pfister, Robert W. Rabbitt

Newspaper Scholarships: Leo Ballweg, Judith Regan

Panhellenic Association of Washington, D. C., Scholarship: Sharon Lee Glenn

Paul Pearson Scholarship: Sister Mary Philip Hornung

Phi Delta Delta Scholarship: Susan A. Roberts

Lulu M. Shepard Scholarship: Jean Marian Myers

David Spencer Scholarship: Leonard Y. Andaya

David Perry Steinman Memorial Scholarship Fund: Jerome S. Mayersak

Mary Lowell Stone Scholarship: Diana Bancker

Tau Kappa Epsilon Scholarship: Alan Price Hawkins

Tobacco Institute Research Committee Scholarship: Seymour Gendelman

University Hospital Scholarships in Medical Technology: Elaine Mickelson, Barbara Kaplan Gonick

Barbara G. Wendt Scholarship: Wendy Joyce Somers

John Withington Scholarship: Eng E. Wang

Ellen Woodhull Scholarship: John Kent Minichiello

Zonta Club of Washington, D. C., Scholarship: Arlene Marian Kevorkian

PRIZES

1961–62

Alpha Chi Sigma Freshman Awards in Chemistry: Joseph Baer Pincus, Joel Ira Shulman, Arthur Joel Sober

Alpha Delta Pi Award in Scholarship and Leadership: Linda Carol Nusbaum

Alpha Kappa Psi Award in Commerce: Philip Gross

Alpha Zeta Omega Award in Pharmacy: Allan Sinclair Davis

American Institute of Chemists Award in Chemistry: Kenneth Bruce Weiner

American Pharmaceutical Association Award in Pharmacy: Barbara Ann Baker

Norman B. Ames Memorial Award in Engineering: Dulany Forrest deButts III

Byrne Thurtell Burns Award in Organic Chemistry: Ronald Hartley Hirz

Martin L. Cannon Memorial Award in Pharmacy: Richard Charles Allen

Wilbur J. Carr Award to that man in the graduating class who has demonstrated outstanding ability in his study of international affairs and who has given evidence of possessing in marked degree the qualities which produce the good citizen and the dedicated public servant: George Thomas Desorcy

Chi Omega Award in Social Sciences: Janet Eileen Morrissey

Columbian Women Award to the graduating senior woman who in her undergraduate life has most nearly fulfilled the objectives of Columbian Women: Joyce Judson Ormsby

Ernest Connolloy Memorial Award for attainment in the field of business administration: Leslie Allan Hubbard

John Henry Cowles Awards in Government: Deanne Clemence Siemer, Paula Roberta Fortucci

DeWitt Clinton Croissant Award for an essay on drama or the theater: John Valentine Brain

E. K. Cutter Award in English: Lydia Jane Pallmé

Isaac Davis Awards in Public Speaking: Harry Qualman, Marvin Michael Waldman, Barbara Susan Carter

Delta Gamma Award for scholarship, extracurricular activities, and service to the University: Mary Conway Thom

Delta Zeta Award in Zoology: Andrew Baker Baskind

Elton Award in Greek: Jeanne Ann Roode

School of Engineering Distinguished Scholar to the senior who graduates with the highest scholastic standing: Howard Thiebaut Hill

Jesse Frederick Essary Award to that student who has given promise of sound citizenship and ability in "forthright reporting": James Roger Black

Joshua Evans III Memorial Award to that man in the graduating class who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows: David George Tuerck

Willie E. Fitch Memorial Award in Chemistry: Kenneth Bruce Weiner

Allie S. Freed Award to that member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine: Lowell Martin Weiss

Charles Glover Award to that student in the Law School who has attained the highest average grade in the third-year, full-time course: Kathryn Muckle Werdegar

Alice Douglas Goddard Award in American Literature: Martin Vester Reece

James Douglas Goddard Award in Pharmacy: Estelle Deborah Luber

Morgan Richardson Goddard Award in Commerce: Philip Gross

Hamilton Watch Award in Engineering: Howard Thiebaut Hill

Alec Horwitz Award to the senior in the School of Medicine who has demonstrated exceptional proficiency in the field of Surgery: Preston Brooks Mayson, Jr.

Gardiner G. Hubbard Memorial Awards in United States History: Phyllis Smith McLeod, Celia Minton Ruth

Kappa Kappa Gamma Award in Botany: Frances Marie Cooper

John Bell Larner Award to that member of the graduating class of the Law School with the highest scholastic standing: John Rogers Stafford

Huron W. Lawson Award in Obstetrics and Gynecology: Preston Brooks Mayson, Jr.

Martin Mahler Award in Materials Testing: Frederick Ellis Hood

Mortar Board Award to the woman student in the sophomore class having a scholastic standing of B or higher and the most outstanding record in activities: Linda Mc... Sennett

Julius S. Neviaser Award in Orthopedic Surgery: Jack Wayne Harvey, Thomas Folk Minas

Omicron Delta Kappa Award to that member of the senior class who, throughout his course, has done the most constructive work in student activities: Bertram Jay Baruff

John Ordronaux Award to that member of the graduating class of the School of Medicine with the highest scholastic standing: Edward A. Janon

Phi Delta Kappa Award in Teacher Education: Woodbury David Weimern

Phi Eta Sigma Award to the beginning male student attaining the highest scholastic average in his first full semester of work: Henry Hugh Heclo

Pi Beta Phi Award to that member of the senior class who, throughout her course, has done the most to promote student activities: Joyce Judson Ormsby

Pi Lambda Theta Award in Teacher Education: Kaleen Katherine Peck

Psi Chi Awards in Psychology: Charles Wesley Swisher, Maria d'Lourdes Gomez Ortega

Ruggles Award in Mathematics: Arnost Heidrich

Sigma Kappa Award in Chemistry: Allan Bruce Goldberg

James MacBride Sterrett, Jr., Award in Physics: Gerald Michael Pohost

Thomas F. Walsh Award in Irish History: Isabel Merrick Davies

Alexander Wilbourne Weddel Award for an essay on World Peace: Ruth Frances Hollands

STUDENT ASSISTANTS

June 1, 1961 to June 1, 1962

Accounting: Willard Culver, John Franceschini, Fred Goldman, Philip Gross, Willia... Howlin, Vincent Imbriani, Nancy Kenn, Kenneth McMahill, Michael Perper

Art: Marjorie Kemp Czyzak (A.B.), Lucinda Ann Hanna, Patricia Ann Smith (A.B.), Faith Diana Stern

Biology: Evangelos Damianos Karandreas, Margaret Ellen Neff, Marcus Crown Russe... Barbara Alice Warrick, Julie Ayres Williams

Botany: Barbara Healy Edwards (A.B.), Rebecca Hilliard Gettens

Business Administration: Maxine Koch, Phyllis Ann Parziale

Chemistry: Stephen Gordon, Marjorie Killian, Kenneth Bruce Weiner

Civil Engineering: Dulany Forrest deButts, Richard Dettmering, Harvey Flatt, David Le... erson (spring), Virginia Noble, Hans Zassenhaus

Dramatic Activities: Ellen Ahr

Economics: Kate Wilder Avery, Paula Roberta Fortucci (spring), Marguerite Ale... Griggs (A.B.), Mary Alice Myers

Education: John Richard Burton (A.B.), Anthony Cardinale (A.M.), George Foste... (A.M.), Rhoda Ezrin Ganz (A.B.), David Iwamoto (A.M.), Alice Maguire, Robert Wil... liams, Henry Edward York (A.M.)

Electrical Engineering: Eliot Cohen, Frank Klisch, Michael Lehman, David Lokerso... (summer, fall), Donald Lokerson (summer, fall), Donald Abram Miller, Mendel Pea... son, Judith Popowsky, Jerome Steffel, Barbara Louise Varga, John Wolfgang

Engineering Administration: Judith Cherrington, Lacey Candace Johnston

English: Janet Carolyn Fricks, Dorothy Katherine Marshall (A.B.), Wanda Rappapor...

Geography: Don Edward Bierman, John Foster, Jr., Martha Louise Mueller, Spencer K... Pearse (summer)

Geology: John Parker, Jr., George Rabchevsky (B.S.), Robert MacLean Turner

History: Jean Rice Anderson (A.B.), John William Boettjer (A.B.), Douglas Lowell Co... (A.B.), Elena Talcott Constantinople (A.B.), Isabel Merrick Davies, Robert Wood... Delp (A.M.), Robert Carl Embry (A.B.), William Graham, Frances Marion Hun... (A.B.), Don Evans McLeod (A.B.), Donald Stewart (A.M.)

Law: Carl Walter Schwarz (B.C.E.), Frederick Thomas Schornhorst (A.B.), John Roge... Stafford (A.B.), Max Volterra (B.S.)

Mathematics: Amalya Johnson, Mathee Son (A.B.)

Mechanical Engineering: Rosanne Forame, Robert McCalley, Clark Pritchett, Robe... Sanford, Donald Flynn Talley

Pharmacy: James Richard Eblen

Philosophy: Linda Ellen Pearlstein

Physical Education for Men: Gene Beverly, Mona Dash, William Dierks, William Mc... Adams, Robert Clark Meador, Alan Meravi, David Saunders, Barry Young

Physics: Joseph Himes, Leota Jane Kendzie (A.B.), Raymond Michael Shirven, Walter Vink
Political Science: Anita Jane Brinckmann (A.B.), Alvin Capp (A.B.), Dorothy Jeanne Carlson, Paula Roberta Fortucci (fall, spring), Julia Ann Hinebaugh, Thomas Page Johnson (A.M.), Benny Kass (B.S., LL.B.), Barbara Knight (A.B.), Stanley Remsberg
Psychology: Sandra Boorstein, Sue Hyde Dodge (summer), Jean Duncan, Diana Galvin, Margaret Johnson (A.B.), Sue Karp, Alice Martinson, William Bateman Moore (A.B.), Adele Potts, Jill Raymond, David Silberman (A.B.), Elizabeth Laura Stirling (A.M.)
Religion: Velma Bonny Barry
Romance Languages: Spencer Rowe Pearse (summer)
Secretarial Studies: Leah Beyda
Sociology and Anthropology: Heather Honey Adler, Carol Ann Cox, Sue Hyde Dodge (fall), Marilyn June Evans, Elizabeth Ann Reid, Elizabeth Kight Simpson, Howard Yager
Speech: Rolande Fleurette Boucher, Janet Beth Ginberg, Karlota Marie Koester (A.B.), Donald Lokerson (summer, fall), Michael Rivers, Linda Kay Stone, Elizabeth Howarth Wells
Statistics: Hugh Brennan, Peter Enis (A.B.), Aaron Knott (A.B.), Karen Dreier Pettigrew, Robert Milton Ross (A.B.), Allen Milton Singer (A.M. in Govt.), Thomas Treples, Thomas C. Varley (A.B. in Govt.), Bryan Williams (A.B.), Archibald Mulford Woodruff III
Zoology: Sandra Bergman, Aaron Blum, Stephen Brown, William Chalfant, John McHenry Garrison, Rosalie Gutride, Dona Burnett Marler (A.B.), Alice Marie Martinson, William Angus Muir (B.S.), Stanley Irving Music, Mary Musselman, Beverly Ruth Teter, Pamela Williams Woodford

SUMMARY OF REGISTRATION

1961–62

Columbian College of Arts and Science

	Fall Semester			*Spring Semester*		
	Men	Women	Total	Men	Women	Total
Lower Division	885	922	1,807	785	849	1,634
Upper Division	366	403	769	375	373	748
Graduate Division	305	189	494	292	160	452
Total	1,556	1,514	3,070	1,452	1,402	2,854

The Graduate Council

Doctor of Philosophy	196	50	246	197	50	247
Unclassified	2	—	2	1	—	1
Total	198	50	248	198	50	248

The School of Medicine

Doctor of Medicine	360	20	380	360	20	380

The Law School

Bachelor of Laws and Juris Doctor	821	39	860	758	31	789
Graduate	31	3	34	28	1	29
Unclassified	15	3	18	18	—	18
Total	867	45	912	804	32	836

The School of Engineering

Undergraduate	460	9	469	414	9	423
Graduate	519	2	521	517	3	520
Unclassified	62	—	62	41	—	41
Total	1,041	11	1,052	972	12	984

The School of Pharmacy

Undergraduate	24	11	35	28	11	39
Unclassified	1	—	1	1	—	1
Total	25	11	36	29	11	40

The School of Education

Undergraduate	64	159	223	61	171	232
Graduate	294	273	557	261	251	512
Unclassified	15	21	36	24	37	61
Total	363	453	816	346	459	805

The School of Government, Business, and International Affairs

Undergraduate	211	66	277	185	65	250
Graduate	487	46	533	522	43	565
Unclassified	20	3	23	16	2	18
Total	718	115	833	723	110	833

College of General Studies Campus Division*

Undergraduate	65	12	77	82	9	91
Graduate	41	—	41	36	3	39
Unclassified	8	1	9	12	1	13
Total	114	13	127	130	13	143

The Division of University Students

University Students	1,039	671	1,710	897	642	1,539

The Division of Special Students

Undergraduate	167	68	235	185	88	273
Graduate	76	20	96	125	35	160
Unclassified	104	33	137	33	6	39
Total	347	121	468	343	129	472

SUMMARY

Undergraduate	2,242	1,650	3,892	2,115	1,575	3,690
Graduate	3,120	642	3,762	3,096	616	3,712
Unclassified	1,266	732	1,998	1,043	689	1,732
Total	6,628	3,024	9,652	6,254	2,880	9,134

Summer Sessions 1961

	Men	Women	Total
Students registered	2,563	1,507	4,070

TEACHING STAFF 1961-62

Professors Emeritus	52
Professors	141
Research Professors	2
Adjunct Professors	5
Professorial Lecturers	78
Clinical Professors	24
Associate Professors	83
Associate Clinical Professors	31
Associate Research Professors	3
Associate Professorial Lecturers	47
Associates in the School of Medicine	142
Assistant Professors	81
Assistant Clinical Professors	100
Assistant Research Professors	9
Lecturers	98
Instructors	30
Clinical Instructors	160
Associates (nonmedical)	46
Fellows in the School of Medicine	33
University Teaching Fellows	23
Graduate Teaching Assistants	32
Technicians	14
TOTAL	1,234

* Off-Campus Division (Sept. 1, 1960 through Aug. 31, 1961): credit courses 6,224; noncredit, Radio and TV courses 1,003; total 7,227.

DEGREES CONFERRED

1961–62

Advanced Professional Certificate (Education)	
Associate in Arts (College of General Studies)	
Associate in Arts (Columbian College)	
Associate in Science (College of General Studies)	
Associate in Science (Columbian College)	
Bachelor of Arts (College of General Studies)	
Bachelor of Arts (Columbian College)	
Bachelor of Arts in Education	
Bachelor of Arts in Government	
Bachelor of Business Administration	
Bachelor of Civil Engineering	
Bachelor of Electrical Engineering	
Bachelor of Laws	
Bachelor of Mechanical Engineering	
Bachelor of Science	
Bachelor of Science in Cartography (College of General Studies)	
Bachelor of Science in Engineering	
Bachelor of Science in Home Economics	
Bachelor of Science in Medical Technology	
Bachelor of Science in Pharmacy	
Bachelor of Science in Physical Education	
Doctor of Business Administration	
Doctor of Education	
Doctor of Juridical Science	
Doctor of Medicine	
Doctor of Philosophy	
Doctor of Science	
Juris Doctor	
Master of Arts (College of General Studies)	
Master of Arts (Columbian College)	
Master of Arts in Education	
Master of Arts in Government	
Master of Arts in International Affairs (College of General Studies)	
Master of Business Administration (College of General Studies)	
Master of Business Administration (School of Government, Business, and International Affairs)	
Master of Comparative Law (American Practice)	
Master of Engineering Administration	
Master of Fine Arts	
Master of Laws	
Master of Science	
Master of Science in Engineering	
TOTAL	

GEOGRAPHICAL DISTRIBUTION OF STUDENTS REGISTERED

1961–62

United States, Territories, and Possessions

	Fall	*Spring*		*Fall*
Alabama	27	27	Delaware	20
Alaska	8	7	District of Columbia	2,432
Arizona	20	20	Florida	94
Arkansas	12	17	Georgia	40
California	167	167	Hawaii	13
Colorado	30	30	Idaho	31
Connecticut	70	64	Illinois	105

	Fall	*Spring*		*Fall*	*Spring*
Indiana	46	46	North Dakota	13	15
Iowa	35	31	Ohio	117	107
Kansas	33	31	Oklahoma	32	26
Kentucky	20	16	Oregon	21	22
Louisiana	30	25	Pennsylvania	350	342
Maine	16	16	Rhode Island	26	28
Maryland	1,615	1,540	South Carolina	27	24
Massachusetts	102	97	South Dakota	12	11
Michigan	81	74	Tennessee	34	37
Minnesota	31	28	Texas	58	59
Mississippi	13	12	Utah	43	40
Missouri	43	45	Vermont	4	5
Montana	12	18	Virginia	2,356	2,241
Nebraska	23	19	Washington	40	36
Nevada	8	8	West Virginia	65	63
New Hampshire	14	14	Wisconsin	32	29
New Jersey	255	242	Wyoming	9	7
New Mexico	16	13	Panama Canal Zone	4	4
New York	486	447	Puerto Rico	11	10
North Carolina	65	62	Virgin Islands	1	1

FOREIGN COUNTRIES

	Fall	*Spring*		*Fall*	*Spring*
Afghanistan	2	3	India	23	30
Argentina	6	6	Indonesia	6	8
Australia	—	1	Iran	12	14
Austria	—	1	Iraq	5	8
Belgium	1	1	Ireland	1	1
Bolivia	10	8	Israel	4	8
Brazil	6	5	Italy	2	3
British Guiana	1	1	Japan	9	9
British West Indies	1	1	Jordan	5	8
Burma	3	5	Kenya	1	1
Cambodia	2	2	Korea	25	27
Cameroon	1	1	Korror Palau Islands	1	1
Canada	13	13	Lebanon	2	3
Chile	2	1	Liberia	1	1
China	14	22	Libya	—	1
Colombia	11	10	Lithuania	1	1
Costa Rica	3	3	Luxembourg	1	—
Cuba	6	5	Malaya	1	1
Czechoslovakia	1	2	Mali	—	1
Denmark	2	1	Marshall Islands	1	—
Dominican Republic	—	1	Mexico	4	3
Dutch Guiana	1	—	Morocco	2	1
Ecuador	2	3	Netherlands	3	1
El Salvador	2	1	Norway	1	1
England	4	8	Pakistan	4	6
Ethiopia	—	2	Panama	8	8
Formosa	1	1	Peru	5	3
France	8	4	Philippines	16	16
Germany	8	12	Poland	1	1
Ghana	2	2	Rumania	1	—
Gold Coast	—	9	Scotland	2	2
Greece	6	—	Spain	1	—
Haiti	2	3	Sudan	1	—
Honduras	1	1	Sweden	1	—
Hong Kong	2	2	Switzerland	2	1
Hungary	3	4	Thailand	6	6

	Fall	Spring		Fall	Spring
Turkey	8	9	Venezuela	6	5
Union of Soviet Socialist Republics	1	—	Viet Nam	11	10
United Arab Republic	7	11	Yugoslavia	8	6
			Stateless	2	—

ALUMNI AND ALLIED ASSOCIATIONS

THE GENERAL ALUMNI ASSOCIATION

The objectives of this Association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or of the Board of Trustees of the University. Active members are those eligible members who are current contributors to or life members of The George Washington University General Alumni Association, the Alumni Association of any school of the University, or contributors to the Alumni Fund.

The Alumni Office is in Bacon Hall, 2000 H Street NW., Washington 6, D. C.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

1962–63

GOVERNING BOARD

President.—J. Frank Doubleday, A.M. 1955; 404 N. Kenmore Street, Arlington, Va.

Vice President.—John R. Busick, A.B. 1936; Director of Development, Jefferson Medical College and Center, Philadelphia, Pa.

Secretary.—Helen S. Stone, A.M. 1949, Ph.D. 1954; 2124 Eye Street NW., Washington, D. C.

Treasurer.— ————————

Columbian College of Arts and Sciences:

John R. Busick, A.B. 1936; Director of Development, Jefferson Medical College and Center, Philadelphia, Pa.

Washington I. Cleveland, LL.B. 1923, A.B. 1926; 1712 G Street NW., Washington, D. C.

Graduate Council:

Helen M. Dyer, M.S. 1929, Ph.D. 1935; 3024 Tilden Street NW., Washington, D. C.

Helen S. Stone, A.M. 1949, Ph.D. 1954; 2124 Eye Street NW., Washington, D. C.

School of Medicine:

Frederick Y. Donn, M.D. 1941; 1835 Eye Street NW., Washington, D. C.

Donald H. Leeper, Jr., M.D. 1938; 1835 Eye Street NW., Washington, D. C.

Law School:

L. Jackson Embrey, A.B. 1937, LL.B., LL.M. 1949; 1437 N. Courthouse Road, Arlington, Va.

C. Jules Rose, A.B. 1942, LL.B. 1949; 1511 K Street NW., Washington, D. C.

School of Engineering:

George M. Jackson, B.M.E. 1932; 4700 Connecticut Avenue NW., Washington, D. C.

Paul Kuzio, B.C.E. 1955; 3601 Van Ness Street NW., Washington, D. C.

School of Pharmacy:

F. Royce Franzoni, Jr., B.S. in Phar. 1936; 627 Pennsylvania Avenue NW., Washington, D. C.

William E. Pannill, B.S. in Phar. 1950; 2104 Marilyn Drive SE., Washington, D. C.

School of Education:

J. Dallas Shirley, B.S. in P.E. 1936, A.M. in Ed. 1945; 4409 N. Pershing Drive, Arlington, Va.

Abbie O. Smith, B.S. in P.E. 1953, A.M. in Ed. 1958; 315 Whitestone Road, Silver Spring, Md.

School of Government, Business, and International Affairs:

Thaddeus A. Lindner, A.B. in Govt. 1951; 2140 Pennsylvania Avenue NW., Washington, D. C.

College of General Studies:

Reginald D. Barta, A.B. 1958; 7420 Blackford Street, Arlington, Va.

J. Frank Doubleday, A.M. 1955; 404 N. Kenmore Street, Arlington, Va.

Faculty:

George M. Koehl, A.M. 1933; 515 Mansfield Road, Silver Spring, Md.

Frederick R. Houser, A.B. 1948, A.M. in Govt. 1950; 2141 Eye Street NW., Washington, D. C.

THE GEORGE WASHINGTON UNIVERSITY MEDICAL ALUMNI ASSOCIATION

The George Washington University Medical Association, the organization of graduates of the School of Medicine, was established in 1905 and since 1926 has been affiliated with the General Alumni Association. The objects of the Association, as stated in the constitution, are "to provide constructive services for the alumni of The George Washington University School of Medicine, for furthering the art and science of medicine, research, and for the promotion of the welfare of The George Washington University School of Medicine, its students, The George Washington University Hospital and its trainees." The Medical Alumni Office is in the School of Medicine, 1335 H Street NW., Washington, D. C.

1961–62

President.—Alfred E. Brigulio, M.D. 1936; 2025 Eye Street NW., Washington, D. C.

President Elect.—Howard E. Ticktin, A.B. 1950, M.D. 1954; 5872 Marbury Road, Bethesda, Md.

First Vice President.—Frederick T. Reuter, M.D. 1944; 1835 Eye Street NW., Washington, D. C.

Second Vice President.—Maxine A. Schurter, M.D. 1951; 2700 Q Street NW., Washington, D. C.

Secretary.—Thomas M. Peery, M.D., 226 Belle Haven Road, Alexandria, Va.

Treasurer.—William P. McKelway, M.D. 1950; 4759 Berkley Terrace NW., Washington, D. C.

Council:

George Speck, M.D. 1941; 2772 S. Randolph, Arlington, Va.

Frederick B. Hartsock, M.D. 1945; 1712 Eye Street NW., Washington, D. C.

Frederick Y. Donn, M.D. 1941; 1835 Eye Street NW., Washington, D. C.

Brooks G. Brown, M.D. 1939; 1835 Eye Street NW., Washington, D. C.

Edward E. Ferguson, M.D. 1936; 1835 Eye Street NW., Washington, D. C.

Charles S. White, M.D. 1942; 1801 Eye Street NW., Washington, D. C.

THE GEORGE WASHINGTON LAW ASSOCIATION

The George Washington Law Association, the organization of graduates of the Law School, was founded in 1912 and has been affiliated with the General Alumni Association since 1926. Its purposes as stated in the constitution are to promote high standards of legal education, to keep the alumni of the Law School in close touch with one another and especially with members of their own classes, to gather and publish at intervals information as to the whereabouts and activities of these alumni, and to further the interests of the Law School.

1961–62

President.—Philbrick McCoy, LL.B. 1922, LL.M. 1923; The Superior Court, Los Angeles, Calif.

First Vice President.—Joel Barlow, LL.B. 1935; Union Trust Building, Washington, D. C.

Second Vice President.—Robert M. Gray, LL.B. 1933; 1025 Connecticut Avenue NW., Washington, D. C.

Third Vice President.—Walter F. Sheble, LL.B. 1952; LL.M. 1953; 1025 Connecticut Avenue NW., Washington, D. C.

Secretary.—Edwin S. Nail, LL.B. 1951; 1240 19th Street NW., Washington, D. C.

Treasurer.—Samuel J. L'Hommedieu, Jr., LL.B. 1951, LL.M. 1952; 808 17th Street NW., Washington, D. C.

Executive Committee:

Fontaine C. Bradley, LL.B. 1925; Union Trust Building, Washington, D. C.

W. Cameron Burton, LL.B. 1921; Investment Building, Washington, D. C.

Geoffrey Creyke, Jr., LL.B. 1935; Washington Building, Washington, D. C.

Gordon W. Daisley, LL.B. 1933; 700 10th Street NW., Washington, D. C.

L. Jackson Embrey, LL.B., LL.M. 1949; 6013 5th Road N., Arlington, Va.

Elizabeth S. Freret, LL.B. 1950; 1108 16th Street NW., Washington, D. C.

Joseph D. Hughes, LL.B. 1934; 525 William Penn Place, Pittsburgh, Pa.

Thomas S. Jackson, A.B. 1933, LL.B. 1935; 1025 Connecticut Avenue NW., Washington, D. C.

Clarence T. Kipps, Jr., LL.B. 1953; 1001 Connecticut Avenue NW., Washington, D. C.

Arthur G. Logan, A.B. 1925, LL.B. 1926; Continental American Life Building, Wilmington, Del.

George E. Monk, LL.B. 1930, LL.M. 1934; Colorado Building, Washington, D. C.

L. Karlton Mosteller, LL.B. 1924 (National University); 2712 First National Building, Oklahoma City, Okla.

Bernard I. Nordlinger, LL.B. 1933; Southern Building, Washington, D. C.

Kenneth Wells Parkinson, LL.B. 1952; Tower Building, Washington, D. C.

James F. Perrin, LL.B. 1937 (National University); 2101 Connecticut Avenue NW., Washington, D. C.

Sam Houston, ex officio, LL.B. 1936 (National University); 1710 H Street NW., Washington, D. C.

THE LIBRARY SCIENCE ALUMNI ASSOCIATION

The Library Science Alumni Association was organized in 1932 by graduates of the Division of Library Science and became an affiliate of the General Alumni Association in 1935. It was established to foster a closer relationship between the Faculty

and graduates and to further the interests of the Division of Library Science and of the University as a whole.

1961–62

President.—Betty Hill Reavis, A.B. 1933; Medical Library, St. Elizabeths Hospital, Washington, D. C.
Vice President.—Mary Louise Beitzell, 1415 Tuckerman Street NW., Washington, D. C.
Secretary.—Margaret Brown Wilson, A.B. 1933; 6620 Marlboro Pike, District Heights 28, Md.
Treasurer.—Helene Marie Gingras, A.B. 1932; 316 North Carolina Avenue SE., Washington, D. C.

THE ENGINEER ALUMNI ASSOCIATION OF THE GEORGE WASHINGTON UNIVERSITY

The Engineer Alumni Association was organized in 1936 and has been affiliated with the General Alumni Association since that time. Its objects are to unite the graduates and Faculty of the School of Engineering in closer fellowship, to promote the general welfare of the School of Engineering and of the University at large, to foster activities of the engineering organizations recognized by the University, and to advance the profession of engineering in general.

1962–63

President.—Harlan J. Oelke, B.E.E. 1956; 5514 33d Street NW., Washington, D. C.
Vice President.—Thomas Creswell, B.S. in Eng. 1956; 2701 Philbun Drive, Adelphi, Md.
Secretary.—William Duff, B.E.E. 1959; 107 W. Masonic View Avenue, Alexandria, Va.
Treasurer.—Derrill C. Rohlfs, B.E.E. 1955, M.S. in Eng. 1959; 4306 Sheldon Avenue SE., Washington, D. C.
Delegates:
1930–39.—J. Meigs Brearley, B.M.E. 1931; 1452 Juniper Street NW., Washington, D. C.
1940–49.—Warren C. Crump, B.C.E. 1940; 4337 16th Street NE., Washington, D.C.
1950–55.—David Barry Boyce, B.M.E. 1954; 8503 16th Street, Silver Spring, Md.
1956–59.—Thomas W. Coleman, B.E.E. 1959; 6005 5th Road N., Arlington, Va.
1960.—Herbert S. Wilkinson, B.E.E. 1961; 1317 Woodside Parkway, Silver Spring, Md.
1961.—John V. Howie, B.E.E. 1961; 333 S. Glebe Road, Arlington, Va.

THE GEORGE WASHINGTON UNIVERSITY NURSES ASSOCIATION

The George Washington University Nurses Association was organized in 1914. In 1936 this organization was made an integral part of the General Alumni Association, and graduates of the School of Nursing were accorded associate membership. The objects of the Association are to hold in unison the graduates of The George Washington University Hospital School for Nurses, to care for its sick members, and to promote the advance of nursing in the interest of The George Washington University Hospital.

1960–61

President.—Flora Schroebel; 1830 17th Street NW., Washington, D. C.
Vice President.—Ruby Gottwals; 2129 19th Street N., Arlington, Va.
Secretary.—Laura Sanders; 2707 Adams Mill Road NW., Washington, D. C.
Treasurer.—Alma W. Binks; 4821 16th Street NE., Washington, D. C.

WOMEN'S PHYSICAL EDUCATION ALUMNAE ASSOCIATION

The purpose of this organization is to foster and promote the teaching profession in the fields of Health, Physical Education, and Recreation. Its functions are (1) to attract students to the profession who show evidence of outstanding teaching capability, (2) to offer professional guidance to members in this field of work, (3) to render service to the community, (4) to render service to the University.

1961–62

President.—Beverlie Giss Latimer, B.S. in P.E. 1958; 315 Franklin Street NE., Washington, D. C.
Secretary.—Arlene D. Roeber, B.S. in P.E. 1959; 3 Pooks Hill Road, Bethesda 14, Md.
Treasurer.—Eleanor Baudino, B.S. in P.E. 1955; 4211 Oakridge Lane, Chevy Chase 15, Md.

REGIONAL ALUMNI CLUBS

Regional alumni clubs sponsored by the General Alumni Association are maintained in the following places: Los Angeles, Calif.; Miami, Fla.; Atlanta, Ga.; Chicago, Ill.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; Kansas City, Mo.; Brooklyn, N. Y.; New York, N. Y.; Cleveland, Ohio; Tulsa, Okla.; Philadelphia, Pa.; Pittsburgh, Pa.; Dallas, Texas; Seattle, Wash.; Milwaukee, Wis.; Arkansas; Northern California; New Jersey; Ohio River Valley; Utah; Hawaii; Philippine Islands; Puerto Rico.

Information about the officers and activities of these clubs may be obtained from the Alumni Office of the University.

THE LETTERMEN CLUB

The membership of this organization shall consist of those men who, for participation in a sport at The George Washington University, have been awarded varsity letters or freshman numerals, who are no longer undergraduate students of the University; and those men who, for managing a freshman or varsity sport, received letters or numerals.

The objectives of the club are to (1) bring together on a social level former lettermen of all sports, (2) renew acquaintances and promote fellowship, (3) encourage higher ideals of intercollegiate athletics at the University, and (4) assist the University in matters pertaining to athletics when requested.

1961–62

President.—Carl T. Bodolus, A.B. 1954, LL.B. 1960; 2301 41st Street NW., Washington, D. C.
Vice President.—Joseph P. Brennan; 9923 Old Spring Road, Kensington, Md.
Treasurer.—Adolph Paul Biasini, B.S. 1949, B.S. in Phar. 1953; 3424-A S. Utah Street, Arlington, Va.

Secretary.—Joseph J. Bernot, B.S. in P.E. 1950, A.M. in Ed. 1953; 3720 Northampton Street NW., Washington, D. C.

THE GRADUATE ENDOWMENT FUND

The Graduate Endowment Fund was founded by the class of 1926 with the object of providing endowment to be used for the development of the University. Membership is limited to seniors and graduates who sign a pledge of $100, payable annually in ten equal installments.

The pledge notes and funds are held in trust. When the principal reaches the sum of $100,000, the Board of Administrators of the Fund may pay the University such sums as it may vote for the erection of buildings, acquisition of sites, maintenance, and purchase of equipment. At no time may money be drawn so as to leave a balance of less than $50,000 on deposit.

THE COLUMBIAN WOMEN

The objectives of this organization are (1) the promotion of acquaintanceship among its members, (2) the advancement of women by the founding of scholarships in the various departments of the University, and (3) the promotion of the interests of the University.

Membership

The following persons shall be eligible for active membership: (a) any woman who is currently registered or has been previously registered as a student in The George Washington University; (b) any woman member of the Faculties or Board of Trustees, any woman on the administrative staff; the wife of any member of the Faculties, Board of Trustees, or of the administrative staff; (c) any woman recipient of an honorary degree from the University.

1962–63

President.—Margaret Davis, A.B. 1937, A.M. 1941; 1637 31st Street NW., Washington, D. C.

First Vice President.—Margaret E. Moore, 1109 Cross Drive, Alexandria, Va.

Second Vice President.—Alice Tolliver, A.B. 1957; 4805 Pomponio Place, Annandale, Va.

Recording Secretary.—Tahmineh Parsons, B.S. 1955, A.M. 1958; 2101 Yorktown Road NW., Washington, D. C.

Corresponding Secretary.—Ruth E. Nicalo, A.B. 1951; 6008 Berkshire Drive, Bethesda, Md.

Assistant Corresponding Secretary.—Lillian Guest, A.B. 1960; 2150 Pennsylvania Avenue NW., Washington, D. C.

Treasurer.—Anne Calabrisi; 3187 S. Stafford Street, Arlington, Va.

Assistant Treasurer.—Mary C. Van Story, A.B. 1949; 3427 Porter Street NW., Washington, D. C.

Historian.—Sue S. Burnett, A.B. 1941; 3034 Cambridge Place NW., Washington, D. C.

Past President.—Dora M. Ihle, A.B. 1935, A.M. 1936; 2475 Virginia Avenue NW., Washington, D. C.

THE WOMEN'S BOARD OF THE GEORGE WASHINGTON UNIVERSITY HOSPITAL

The object of this organization is to aid in every way the interests and advancement of The George Washington University Hospital. Meetings are held on the first Wednesday of each month, October to June, inclusive. Inquiries regarding membership should be addressed to the Corresponding Secretary, The George Washington University, Washington 6, D. C.

1962–63

President.—Mrs. Barton W. Richwine
First Vice President.—Mrs. Samuel Burgess II
Second Vice President.—Mrs. Francis L. Kiep
Third Vice President.—Mrs. John F. Shields
Recording Secretary.—Mrs. William P. McKelway
Corresponding Secretary.—Mrs. Joseph H. Roe
Assistant Corresponding Secretary.—Mrs. Robert B. Jacoby
Treasurer.—Mrs. John M. Evans
Assistant Treasurer.—Mrs. Wolfram K. Legner
Members at Large:
Mrs. Walter A. Bloedorn
Mrs. Robert W. Bolwell
Mrs. Cloyd H. Marvin
Mrs. John Parks

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Columbian College of Arts and Sciences: Associate in Arts (A.A.), Associate in Science (A.S.), Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)

Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

National Law Center:

Law School: Bachelor of Laws (LL.B.)

Graduate School of Public Law: Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L. (Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

School of Engineering: Engineering Technologist Certificate (Eng. Tech. Cert.), Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (A.P.C.), and Doctor of Education (Ed.D.)

School of Government, Business and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: Associate in Arts (A.A.), Associate in Science (A.S.), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.), Master of Arts in International Affairs (A.M. in I.A.), Master of Business Administration (M.B.A.), and Master of Public Administration (M.P.A.)

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications should be addressed as indicated.

College of General Studies.....Dean of the College of General Studies
Columbian College of Arts and Sciences.....Director of Admissions
Division of University Students.....Director of Admissions
Fellowships, Scholarships, Prizes,
Financial Aid.....Chairman, Committee on Scholarships
General Catalogue of the University.....Director of Admissions
Graduate Council.....Dean of the Graduate Council
Law School.....Director of Admissions
School of Education.....Director of Admissions
School of Engineering.....Dean of the School of Engineering
School of Government, Business,
and International Affairs.....Director of Admissions
School of Medicine.....Director of Admissions
Summer Sessions.....Dean of the Summer Sessions
Schedule of Classes: Fall and Spring Semesters.....Registrar
Schedule of Classes: Summer Sessions.....Dean of the Summer Sessions

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1959

THE LAW SCHOOL, 1865

THE GRADUATE SCHOOL OF PUBLIC LAW, 1959

THE SCHOOL OF ENGINEERING, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

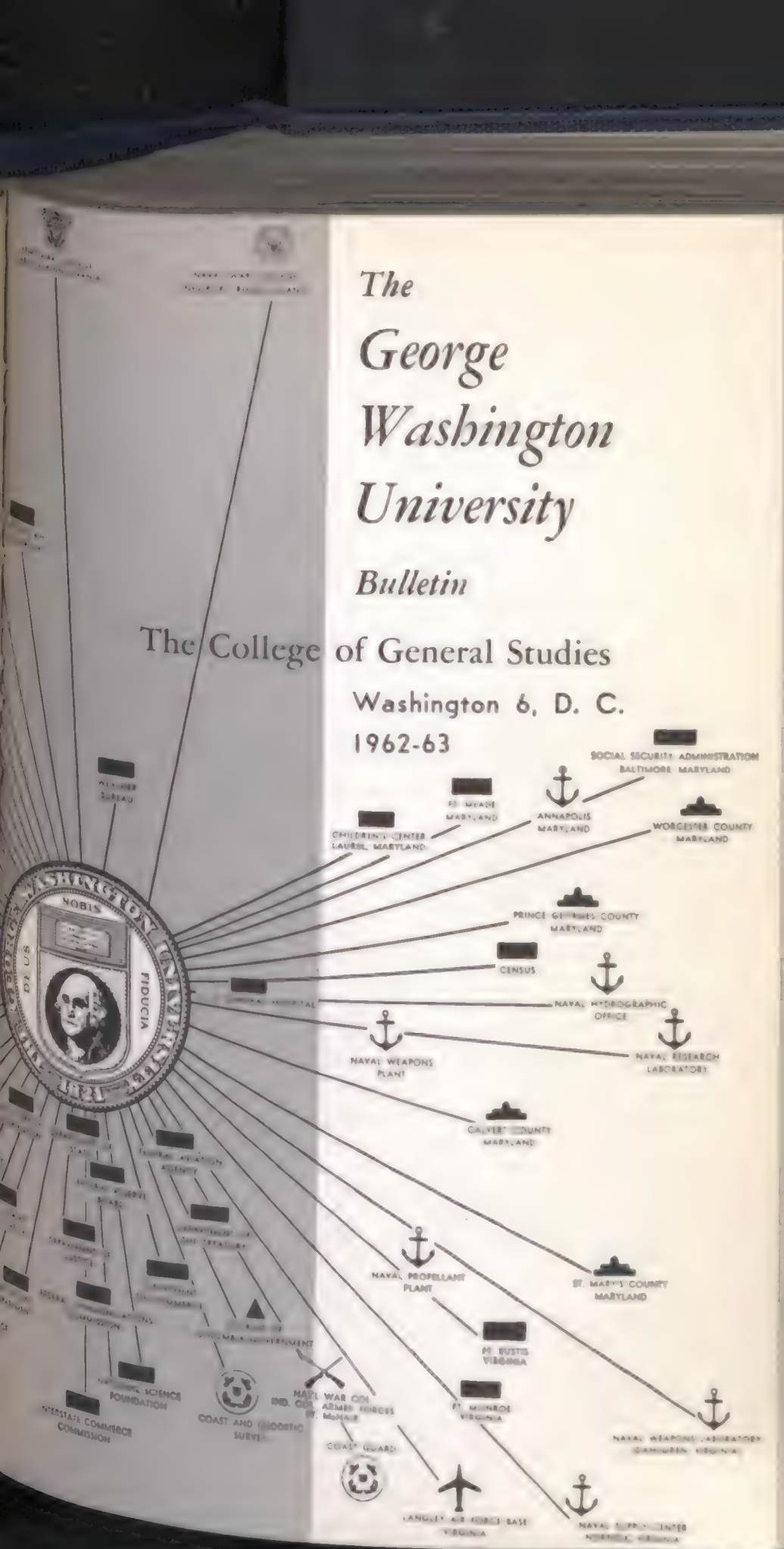
THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF SPECIAL STUDENTS, 1944

THE DIVISION OF AIR SCIENCE, 1951

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898



The

George Washington University

Bulletin

The College of General Studies

Washington 6, D. C.

1962-63

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AT WASHINGTON, D. C.
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OCTOBER, NOVEMBER (2 ISSUES), AND DECEMBER (2 ISSUES)

SECOND CLASS POSTAGE PAID AT WASHINGTON, D. C.

The George Washington University

Bulletin

THE COLLEGE OF GENERAL STUDIES
1962-63

VOLUME LXI AUGUST 1962 NUMBER 14

1962

July

S	M	T	W	T	F	S
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1963

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December

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COLLEGE OF GENERAL STUDIES CALENDAR*

1962–63

1962		
FALL SEMESTER:		
Off-Campus registration†; classes begin	Sept 4–28*	Tues–Fri
Columbian College of Arts and Sciences advising: freshmen, sophomores, new students	Sept 10–19	Mon–Wed
Orientation Assembly: all new students On-Campus	Sept 14	Fri
Curriculum assemblies: new On-Campus students attend one	Sept 14 and 17	Fri and Mon
Placement tests for On-Campus students	Sept 18	Tues
Qualifying examinations	Sept 18	Tues
Registration on Campus†	Sept 20–22‡	Thurs–Sat
Classes begin on Campus	Sept 24	Mon
CGS meeting of Staff of Instruction, Monroe 102, 8:30 P.M.	Sept 28	Fri
Subjects of Master's theses of Feb candidates due in Dean's Office	Oct 5	Fri
Application for Feb graduation due in Registrar's Office	Oct 31	Wed
Veterans' Day. Holiday	Nov 12	Mon
Thanksgiving recess	Nov 22–24	Thurs–Sat
Master's comprehensive examinations	Dec 7 and 8	Fri and Sat
Graduate Record examinations	Dec 8	Sat
Christmas recess	Dec 22–Jan 2	Sat–Wed
1963		
On-Campus classes resume	Jan 3	Thurs
Master's theses of Feb candidates due in Dean's Office	Jan 3	Thurs
Off-Campus registration†; classes begin	Jan 14–Feb 1*	Mon–Fri
Last day of Campus fall-semester classes	Jan 16	Wed
On-Campus examination period	Jan 21–26	Mon–Sat
CGS meeting of Staff of Instruction, Monroe 102, 10:30 A.M.	Jan 26	Sat
Placement tests	Jan 30	Wed
Qualifying examinations	Jan 30	Wed
SPRING SEMESTER:		
Registration on Campus†	Jan 31–Feb 2‡	Thurs–Sat
Classes begin on Campus	Feb 4	Mon

* Off-Campus courses in the College of General Studies may be organized upon request at any time during the year.

† Application for degree, for Graduate Record Examination, and for comprehensive examination is the responsibility of the student and must be made at the time of registration for the last classes required for the degree concerned.

‡ Thursday and Friday, from 12:00 to 8.00 P.M.; Saturday, from 10.00 A.M. to 1.00 P.M.

Subjects of Master's theses of June candidates due in Dean's Office	Feb 8	F
Winter Convocation. Holiday	Feb 22	
Application for June graduation due in Registrar's Office	Feb 28	Thurs
Master's comprehensive examinations	April 5 and 6	Fri and Sa
Graduate Record examinations	April 6	Sa
Easter recess	April 12–17	Fri–Wed
Master's theses of June candidates due in Dean's Office	May 1	Wed
Last day of Campus spring-semester classes	May 15	Wed
Information, Education, and Training Officers Luncheon, Lisner Lounge, 12:30 P.M.	May 16	Thurs
On-Campus examination period	May 20–25	Mon–Sa
Memorial Day. Holiday	May 30	Thurs
Baccalaureate Service	June 2	Sun
Commencement	June 5	Wed

SUMMER SESSIONS:

Registration† for summer classes in the Off-Campus Division	May 27–June 7	Mon–Fr
Registration† on-Campus for eight-week term	June 17	Mon
Classes begin on Campus	June 18	Tues
Independence Day. Holiday	July 4	Thurs
Eight-week term ends	Aug 9	Fri

REGISTRATION ON CAMPUS FALL SEMESTER

1963–64	Sept 19–21	Thurs–Sa

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1962–63

THE UNIVERSITY

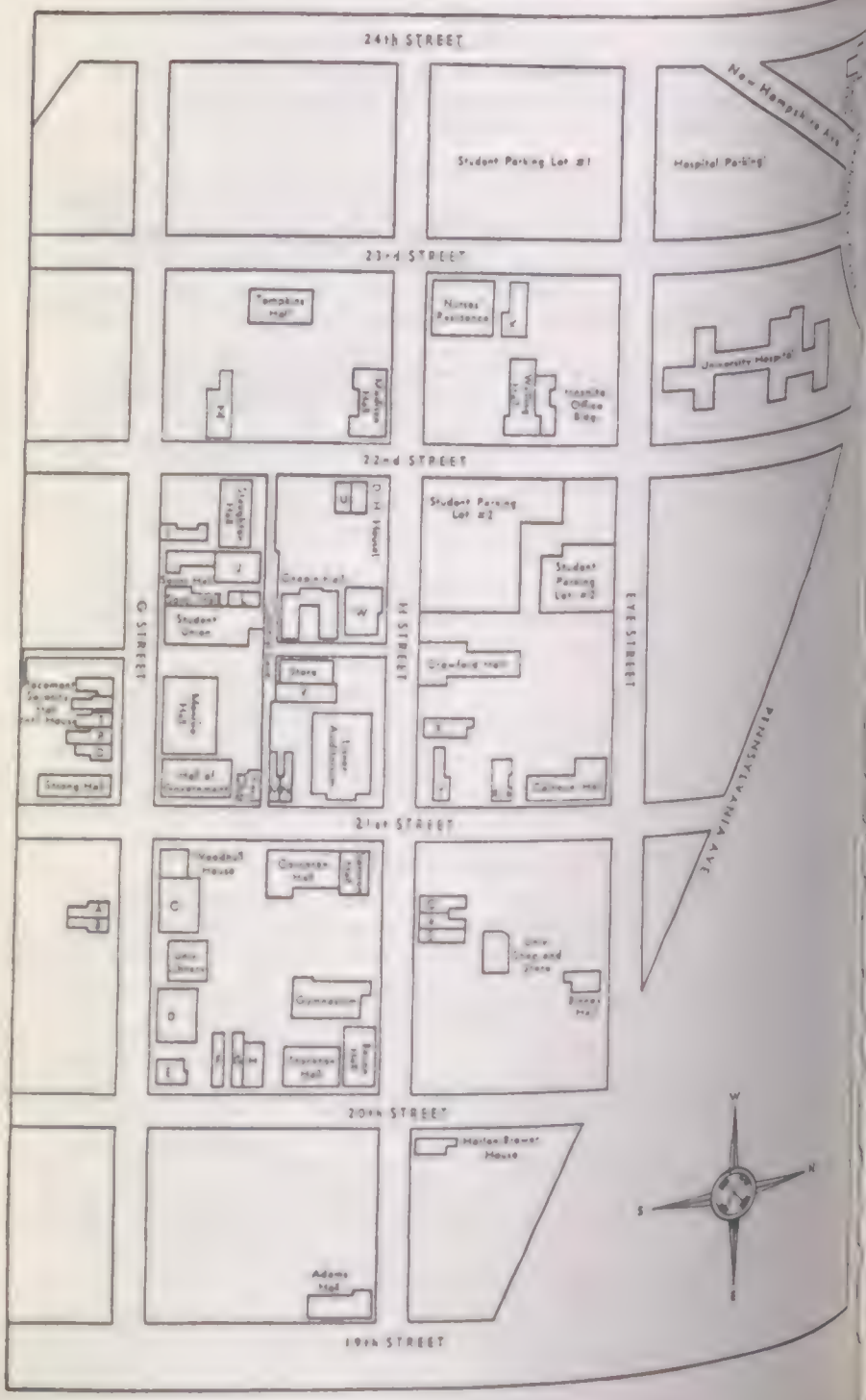
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* On sabbatical leave spring semester 1962-63.


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Hospital Parking
New Hampshire Ave
23rd STREET
Thompkins Hall
Nurses Residence
University Hospital
Hospital Office Bldg.
22nd STREET
Student Parking Lot #2
Student Parking Lot #3
Student Union
Crawford Hall
G STREET
H STREET
EYE STREET
PENNSYLVANIA AVE
Strong Hall
Monroe Hall
Lisner Auditorium
Hall of Government
Corcoran Hall
21st STREET
Woodhull House
Gymnasium
Lisner Library
Lisner Lounge and Store
Bacon Hall
20th STREET
Hamilton-Brewer House
Adams Hall
19th STREET
W
N
S
E

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

It was George Washington's hope that the "General Government" would extend toward such an institution "a fostering hand". No steps were taken by Congress to carry out the provisions of Washington's will, and the stock he had bequeathed for the establishment of a university in the District of Columbia became valueless owing to the failure of the Potomac Canal properties.

Meanwhile, however, a movement was started by private persons under the leadership of Luther Rice to establish an institution of higher learning at the seat of the National Government for the education of the Baptist ministry and to afford general collegiate training. In 1819 an association was formed by Luther Rice, Obadiah B. Brown, Spencer H. Cone, and Enoch Reynolds for the purpose of raising funds to buy land for the use of the college.

A group of the Nation's leaders who were especially interested in Washington's idea became patrons of the college and contributed to funds raised for the purchase of land and erection of buildings. Among them were James Monroe, President of the United States; William H. Crawford, Secretary of the Treasury; John C. Calhoun, Secretary of War; William Wirt, Attorney General; Return J. Meigs, Postmaster General; and thirty-two members of Congress.

Legally to implement the college a petition was made to Congress for the incorporation of "the General Convention of the Baptist Denomination in the District of Columbia for evangelical and literary purposes". This petition was denied by Congress, on April 26, 1820, because of its sectarian character.

Failing to obtain a denominational charter members of the association enlarged their objective to embrace national aims, and with the sponsorship of Government leaders there was presented in Congress a bill for the incorporation of "the Columbian Society for literary purposes", it being proposed to realize in this way "the aspirations of Washington, Jefferson and Madison for the erection of a university at the seat of the federal government."

Acting upon this second petition, on February 9, 1821, Congress chartered Columbian College in the District of Columbia, inserting in the charter by special action the provision "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College or denied any of the privileges, immunities or advantages thereof, for or on account of his sentiments in matters of religion".

Thus Columbian College in the District of Columbia was chartered by Congress as one of the early nonsectarian institutions of higher learning in the United States, under the distinguished favor of President James Monroe and members of his Cabinet.

A tract of approximately forty-seven acres, extending about one-half mile west of Boundary Street (Florida Avenue) between Fourteenth and Fifteenth Streets was purchased and by 1822 the main building was completed sufficiently to use.

Two years later, when the first Commencement was held on December 15, 1824, Congress and the Supreme Court adjourned their sessions to enable their members to attend the exercises. President Monroe, John Quincy Adams, John C. Calhoun, Henry Clay, and the Marquis de Lafayette headed the eminent company in attendance.

By an act of Congress of March 3, 1873, the name of the College was changed to "Columbian University", in recognition of the enlarged scope of the institution. In 1884 the University was moved from its first location on "College Hill", now Columbia Heights, to the new University Hall built for it at Fifteenth and H Streets. Near-by buildings accommodated the School of Medicine and somewhat later, the Law School.

For a period of six years, from 1898 to 1904, the University was placed under control of the Baptist Denomination. In 1904 an act restoring the original secular character of the University and authorizing change of name to The George Washington University was passed by Congress.

Subsequently all colleges, schools, and divisions of the University except the School of Medicine were brought together in the area bounded by Nineteenth, Twenty-third, and G Streets, and Pennsylvania Avenue NW. The School of Medicine is situated on H Street between Thirteenth and Fourteenth Streets NW.

The endowment of the University is $7,633,000.

THE COLLEGES, SCHOOLS, AND DIVISIONS

The George Washington University includes thirteen colleges, schools, and divisions, as follows:

Columbian College of Arts and Sciences offers the four-year programs leading to the degrees of Bachelor of Arts and Bachelor of Science. In cooperation with the Department of Pathology and the University Hospital, it offers a course in Medical Technology leading to the degree of Bachelor of Science in Medical Technology. In addition to the four-year programs, Columbian College offers two-year curricula, including preprofessional and terminal, leading to the degrees of Associate in Arts and Associate in Science. At the graduate level, Columbian College offers studies leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The National Law Center includes the Law School and the Graduate School of Public Law. The Law School offers professional courses leading to the degree of Bachelor of Laws. The Graduate School of Public Law offers programs leading to the degrees of Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering and Applied Science offers courses leading to the Engineering Technologists Certificate and the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of

Science in Engineering, Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

The School of Pharmacy offers courses leading to the degree of Bachelor of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education and Bachelor of Science in Physical Education, and graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government, Business, and International Affairs offers work leading to the following degrees: (1) Bachelor of Arts in Government with a major in International Affairs or Public Affairs; (2) Bachelor of Business Administration with a major in Accounting, Business Administration, or Business and Economic Statistics; (3) Master of Arts in Government with a major field in International Affairs, Public Affairs, Public Administration, Personnel Administration, or Economic Policy; (4) Master of Business Administration with a major field in Accounting, Business and Economic Statistics, General Business Administration, Hospital Administration, or Personnel Administration; (5) Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University through its Off-Campus Division, Campus Division, and Division of Community Services. This College offers programs leading to the degrees of Associate in Arts; Associate in Science; Associate in Secretarial Administration; Bachelor of Arts; Bachelor of Science in Cartography; Bachelor of Business Administration; Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration; Master of Business Administration; Master of Arts in International Affairs; and Master of Public Administration.

The Division of University Students makes available campus courses for mature students, not candidates for degrees in this University.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Within a few blocks are the buildings housing the offices of many of the departments of the Government.

GOVERNMENT

The government and general educational management of The George Washington University are vested in a self-perpetuating Board of Trustees, with the President of the University as a member ex officio. The members of the Board are named

for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

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* On leave of absence fall semester 1962–63.
† Acting Director, fall semester 1962–63.
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1964: A. R. Johnson, B. S. Root

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* The Dean and Assistant Dean are members ex officio of all committees.
† The Dean of Faculties, the Dean and Assistant Dean of the College are members ex officio of the Council

GENERAL INFORMATION

The objectives of the College of General Studies are to extend the educational facilities of the University; to introduce experimental programs of study for mature students; and to provide auxiliary educational services other than formal programs of study.

Established in 1950, the College of General Studies is organized into the following divisions: the Off-Campus Division, the Campus Division, and the Division of Community Services. It also conducts institutes, conferences, and special programs. Offices are in building F at 706 Twentieth Street NW.

Academic Standards

The staff of instruction is made up of members of the regular University Faculty and staff of instruction and other individuals of recognized academic and professional competence.

All academic standards of the University are maintained in off-campus credit courses.

Limits on the size of classes may be imposed in order to maintain the quality of instruction.

OFF-CAMPUS DIVISION

This Division works closely with personnel administrators, training officers, school officials, and others interested in developing programs of in-service training, in response to increased demands of government, education, business, and industry. Programs are also offered for service personnel who wish to work toward degrees or for professional proficiency. Off-Campus centers are listed on pages 47–67.

Types of Programs

The College offers courses in liberal arts, education, and business administration on the college or university level for which there is a sufficient demand and for which a qualified instructor can be found, regardless of whether such courses are included in the regular offering of the University. According to the subject matter and the wish of the organizing group, courses are arranged as credit courses applicable toward a degree or as noncredit courses. For information concerning arrangements for courses or comprehensive programs of study, phone FEderal 8-0250, Extension 441.

How to Organize an Off-Campus Program

Any organization, group, installation, or agency interested in having the University organize and conduct a course or a comprehensive educational program, should get in touch with the Off-Campus Division of the College of General Studies (FEderal 8-0250, Extension 441). A representative will be sent upon request to discuss organizational plans.

Television Courses

In cooperation with Channel 9, WTOP-TV in Washington, D. C., the College of General Studies has offered, since the spring of 1959, credit and noncredit television courses as part of the "Classroom Nine" series. Courses are scheduled Monday, Wednesday, and Friday from 6:30 to 7:00 A.M. The registration fee includes the cost of textbook and telecourse guide.

During the academic year 1961–62, the College of General Studies, in coopera-

tion with "Continental Classroom" and WTOP-TV Channel 9, offered a two-semester course in American Government, *The Structure and Function of American Government*. The course was taught by Dr. Peter Odegard, of the University of California, and was telecast to over 130 colleges and universities throughout the United States. Each semester of the course carried three hours credit. A course in Economics is planned for presentation in a similar manner for the academic year 1962–63. The registration fee does not include the cost of textbooks and telecourse guide materials. The time for the courses is 6:30 to 7:00 A.M., Monday through Friday, coinciding with the academic year.

During the spring of 1962, the College of General Studies, in cooperation with the National Naval Medical Center, offered a credit and noncredit television course in *Beginning Russian* to a closed circuit network consisting of the Naval Medical Center, Walter Reed Army Medical Center, the National Institutes of Health, the Air Force Hospital at Andrews Air Force Base, the Army Hospital at Fort Belvoir, the Army Hospital at Fort George Meade, and the Army Hospital at Fort Detrick. The course was scheduled for Monday, Wednesday, and Friday from 12:10 to 1:00 P.M. The registration fee included the cost of textbook and telecourse materials.

Additional television courses may be offered from time to time. For further information, telephone Marvin J. Powers, College of General Studies, 706 Twentieth Street NW.; FEderal 8-0250, Extension 487.

The Coordinator for television programs is Lillian Brown, Director of Radio and Television, Building S, Room 22, 2025 H Street NW.; FEderal 8-0250, Extension 370.

Radio Courses

In cooperation with WTOP AM and FM in Washington, D. C., the College of General Studies offered a noncredit course in Conversational Spanish during the spring of 1962. The registration fee included the cost of textbook and radio course materials.

Additional radio noncredit courses may be offered from time to time. For further information, telephone Marvin J. Powers, College of General Studies, 706 Twentieth Street NW.; FEderal 8-0250, Extension 487.

The Coordinator for radio courses is Lillian Brown, Director of Radio and Television, Building S, Room 22, 2025 H Street NW.; FEderal 8-0250, Extension 370.

ADMISSION

Registration in an off-campus course constitutes admission to that course only. It does not constitute admission to degree candidacy or carry with it permission to attend University classes on campus.

Credit Courses

Registration is conducted before or at the first meeting of each class. Transcripts of previous academic work are not required. Registration is restricted to those whose qualifications indicate that they are able to complete the courses successfully.

Auditing.—With the permission of the instructor, adequately prepared students may register as "Auditors". An auditor is not required to take active part in the exercises or to take examinations. No grades will be reported, and no credit will

be received. Tuition is the *same* as for credit courses. If a course has 15 sessions a student may, with the approval of the Dean, change from credit to audit status prior to the 10th class session. If a course has 30 sessions, a student may, with the approval of the Dean, change from credit to audit status prior to the 20th class session. A student will not be permitted to change from audit to credit status after the second class session of any course.

Concurrent Registration.—A student registered as a degree candidate in any other college or school of the University may take credit courses in the College of General Studies *only by permission (granted prior to registration) of the dean* of the college or school concerned. The Concurrent Registration form, available at the Office of the College of General Studies, must be filled in by the student, signed by the dean of the college or school concerned, and submitted *with the registration form.*

Noncredit Courses

Noncredit courses are open to anyone interested in enrolling. When a course is organized at the request of a particular agency or group, admission may be restricted to the students recommended by the sponsoring organization.

DEGREE CANDIDACY

Application for degree candidacy should be made only if there is a reasonable assurance that the student will be in the area long enough to complete the requirements. Credits granted by this College for the General Educational Development tests and for service schools and correspondence courses may or may not be accepted by another institution or by other schools and colleges of this University.

The following factors are considered in determining the eligibility of an applicant:

1. The adequacy of previous academic work as preparation for the course of study contemplated, including quantity and quality of work and the standing of the institution in which it was done.
2. Results of specified tests, when prescribed by the Committee on Admissions.
3. The aptitude of the student for the curriculum contemplated.
4. The character of the student.

The University reserves the right to refuse admission to any student who has a previous academic record of such grade as to create doubt of his ability to pursue college work successfully, or who, for any other reason, would not be an acceptable student.

METHODS OF ADMISSION

From Secondary Schools

An applicant from a secondary school may seek to qualify for admission to degree candidacy by certificate or examination. In either case, the applicant must send the high school record form, available at the Office of the Director of Admissions or at the College of General Studies, to his high school principal with the request that the principal fill it out and mail it directly to the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

Consideration for admission is based upon the combined evidence of (1) an acceptable certificate of graduation, showing a minimum of fifteen "units" * from an accredited secondary school; (2) the principal's statement that the applicant is ade-

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 60-minute periods of prepared classroom work.

quately prepared to undertake college work with reasonable prospect of success; (3) the results of College Entrance Examination Board scores submitted on the Scholastic Aptitude Test (for students over twenty-one years of age appropriate tests may be prescribed); and (4) course work completed with the College of General Studies prior to making application for admission. (See Special Requirements for Admission to Degree Candidacy.)

Certification by the principal that the student has satisfied all curriculum requirements of the school will be accepted in lieu of any prescribed distribution of units.

A desirable secondary school program in preparation for college would include four years of English, at least two years of one foreign language, two years of natural or physical science with laboratory instruction (beyond "General Sciences"), two or three years of social studies (with concentration on history), one or two years of mathematics.

The College of General Studies Committee on Admission and Advanced Standing will consider the adequacy of the qualifications for academic success of an applicant who, because of unusual circumstances, does not present all the formal requirements stated above.

From Higher Institutions

An applicant for advanced standing may be considered for admission upon the presentation of satisfactory credentials from an accredited institution of higher learning.

Properly certified courses taken at accredited colleges or universities may be applied toward a degree in the College of General Studies, subject to the curriculum requirements of the degree program for which admission is sought. Work of low passing grade (such as *D* or the equivalent) is not acceptable for transfer. However, a course on which a grade of *D* has been received may be used to satisfy the curriculum requirement, but may not be counted toward the total number of semester hours required for the degree.

The University reserves the right to refuse credit for transfer in whole or in part or to allow it provisionally. Credit so given may be withdrawn for subsequent poor work.

It is the responsibility of the student to have an official transcript sent directly from each educational institution formerly attended to the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

If the transcript of record from a higher institution includes the record of his secondary school work, it is not necessary for the applicant to have forwarded a separate record from the principal of the secondary school.

Special Requirements for Admission to Degree Candidacy

To be eligible for admission to degree candidacy the student must have satisfactorily completed 6 semester hours of approved academic work in the College of General Studies. Application for degree candidacy should be filed as soon as the required 6 hours are satisfactorily completed.

Twelve semester hours of acceptable work are required of applicants whose previous college records might make admission questionable. A grade of *C* or better is required for such qualifying courses toward undergraduate degrees; for Master's candidacy an average of *B* or better is required for undergraduate prerequisite courses, *S* (satisfactory) or *E* (excellent) for graduate courses.

Students must confer with a Director or Assistant Director of either the Campus

or Off-Campus Division before applying for admission to degree candidacy. Appointments may be made by telephone (FEderal 8-0250, Extension 441) or by letter.

Advanced Standing

In addition to credit allowed in transfer from other accredited colleges or universities, see "From Higher Institutions", above, a maximum of 30 semester hours of advanced standing may be obtained by any combination of the following methods. For detailed information concerning advanced standing acceptable in the curriculum contemplated, see "Advanced Standing" under the degree concerned.

1. *GED Tests.**—A maximum of 24 semester hours obtained on the basis of the College Level GED test (first year):

Test 1: Correctness and Effectiveness of Expression
English 1–2: *English Composition* (6)
Test 2: Interpretation of Reading Materials in the Social Studies
Political Science 9: *Government of the United States* (3)
Sociology 2: *Man, Culture, and Society II* (3)
Test 3: Interpretation of Reading Materials in the Natural Sciences
Chemistry 3–4: *Fundamentals of Physical Science* (6)
Test 4: Interpretation of Literary Materials
English 51–52: *Introduction to English Literature* (6)

Credit earned by GED tests does not substitute for courses required in or prerequisite to a departmental major, and must not duplicate credits previously earned in college courses. Service personnel should make arrangements to take GED tests, prior to or at the time of applying for degree candidacy, through the education officers. No decision on an application can be reached until the tests have been evaluated.

2. *Service Schools.*—A maximum of 24 semester hours may be obtained on the basis of service schools satisfactorily completed, as evaluated by the United States Armed Forces Institute Guide to the Evaluation of Educational Experience in the Armed Forces. Ordinarily such credits are counted as electives. No credit will be allowed for military experience as such.

3. *Validating Examinations.*—A maximum of 24 semester hours may be obtained by validating examinations. With the approval of the Dean or the Assistant Dean and the department concerned, permission to take such examinations is granted those who are qualified by work experience and background. Validating examinations must be completed during the first calendar year in which the student is registered as a degree candidate. The fee for each three-hour course examination is $44.

4. *Correspondence Courses.*—A maximum of 12 semester hours may be earned through the successful completion of correspondence courses of college level which are on the approved list of The George Washington University.

Examination for Waiving Curriculum Requirements

During the first full semester of degree candidacy, a student wishing to omit a required course may, with the permission of the Dean or the Assistant Dean, take a waiver examination, the passing of which relieves him of the curriculum requirement and qualifies him for registration in an advanced course. *Passing of the waiver examination does not entitle the student to credit toward a degree.* The fee for each three-hour course examination is $5.

* Available to military personnel at military installations only

FEES

(All fees should be paid by check or money order)

Application fee charged each applicant for admission to degree candidacy (payable by check or money order only and sent directly to Office of the Director of Admissions), nonrefundable	$10.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Graduation Fees	
Wherein an Associate's degree is granted	10.00
Wherein a degree other than an Associate's is granted	25.00
Tuition Fees	
On-campus:	
Full-time program (15 hours or more): for each semester†	500.00
Part-time program: for each semester hour†	33.00
Off-campus:	
For each semester hour for which a student registers	22.00
The Education Program of the Armed Forces may defray a maximum of $13.50 a semester hour, for service personnel.	
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree in the College of General Studies. (For procedure, see Graduate Record Examination, pages 27–28)	10.00 6.00
Fee for binding the Master's thesis	5.00
Withdrawal fee, charged each student who drops a course for which he is registered, before the first class meeting	5.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in payment of fees	22.00
Residence fee, charged each off-campus degree candidate who wishes to maintain "in residence" status during any semester of absence from the University	33.00
Residence fee, charged each on-campus degree candidate who wishes to maintain "in residence" status during any semester of absence from the University	5.00 44.00
Fee for each examination to waive a curriculum requirement	1.00
Validating Examination fee	
Transcript fee, charged for each transcript of record after the first	

PAYMENT OF FEES

Off-Campus Courses

For fifteen-week credit course..... Payable in 3 equal installments: the first at time of registration; the second, 30 days after the beginning of the course; the third, 60 days after the beginning of the course. A student who fails to complete all tuition payments no later than 15 days after the fina

* Payable at the time of application for transfer.

† Payment of tuition for a Master's thesis entitles the candidate, during the academic year of registra tion, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again and tuition paid on the same basis as for a repeated course.

installment is due will be automatically suspended and may not attend classes or take final examinations until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of $5.

For eight-week credit course.....Payable in full at registration
For noncredit course.....Payable in full at registration

Campus Courses

For regulations governing the payment of fees for Campus courses, see the University catalogue.

REFUND OF FEES

Off-Campus Courses

In no case will a refund of fees be made for eight-week credit courses or for noncredit courses unless the course is cancelled.

Fifteen-week credit courses.—In no case will the initial payment for a course be refunded unless the course is cancelled. The second and third payments will be waived or refunded if the course is dropped within the first thirty days. The third payment will be waived or refunded if the course is dropped within the second thirty days. No refund will be allowed on withdrawal subsequent to the second thirty-day period.

This regulation does not apply if a student withdraws from one course to enter another, or if a class is cancelled because of insufficient enrollment.

Campus Courses

For regulations governing refund of fees for Campus courses, see the University catalogue.

REGULATIONS

AMOUNT OF WORK

A full-time student who is not on probation may take ordinarily not more than 17 semester hours. A student employed more than 24 hours a week, who is not on probation, may take not more than 10 hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 19 hours. An employed student who meets the same standard may take not more than 12 hours.

A student who accepts employment after registration or at any time during a semester must report that fact immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

The student is held responsible to the instructor in charge of the course for all of the work of the course. All absences must be excused before provision will be made for the student to make up work missed.

Absences will be excused if the number of class hours missed does not exceed the semester hours for the course. In a fifteen-week course in which classes meet once a week, *one* unexcused absence is permitted. In a fifteen-week course in which classes meet twice a week, *two* unexcused absences are permitted. In an eight-week course meeting twice a week, *one* unexcused absence is permitted.

Absences immediately preceding or following holiday periods are counted double. Excuses for two or more consecutive class periods, and for absences from examinations which have been announced in advance, may be obtained only by making written application to the instructor.

INDEPENDENT STUDY PLAN

A student of demonstrated capacity, with special interest in the subject matter of a course, may be permitted to undertake independent study and readings under the personal direction of an instructor, in accordance with the rules of the department or departments concerned.

SCHOLARSHIP

Grades

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors or the administrative staff of the College.

Undergraduate Grading System.—*A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be assigned. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the work of the course. An "incomplete" cannot be made up after the lapse of one calendar year, except by written permission of the Dean's Council.

A student may not repeat, for a grade, a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Dean by the appropriate departmental chairman.

Graduate Grading System.—*E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete), *W* (authorized withdrawal), and *CR* (indicates thesis credit).

Quality-Point Index

Quality points are computed from grades as follows:

For each semester hour of the letter grade—*A*, 4 points; *B*, 3 points; *C*, 2 points; *D*, 1 point; *F*, no points.

Scholarship is computed in terms of the quality-point index. This is done by dividing the total number of quality points by the total number of semester hours for which the student has registered. Example: if a student received an *A* in one three-credit course, and a *B* in another three-credit course, he would compute his quality-point index in this way:

A = 4 x 3 (semester hours) = 12
B = 3 x 3 (semester hours) = 9

6 — 21 ÷ 6 = 3.5 quality-point index

Courses marked *W* or *I* are not considered in determining the index. If an *I* is not superseded by a proper grade within one calendar year, it is automatically computed as zero quality points. Grades in courses taken at other institutions are not considered in computing the quality-point index.

Warnings

At stated intervals during the academic year instructors file in the Office of the College of General Studies the names of those students taking courses with depart-

mental numbers below 100, who are doing work of *D* grade or lower. A "warning" will then be sent to the student. A "warning" constitutes notice to the student that he must consult his instructor and his adviser at the earliest opportunity. "Warning periods" are established during the seventh and eighth weeks of fifteen-week courses, and during the third and fourth of eight-week courses.

Probation

A student must maintain a quality-point index of at least 2.00 or be placed on probation.

A student who has attempted 12 or more semester hours of work and whose quality-point index is between 1.50 and 2.00 will be placed on probation for the period in which he attempts 12 additional semester hours of work. If his quality-point index is still below 2.00 at the end of this probationary period he will be suspended. The Committee on Scholarship reserves the right to extend the period of probation even if the student has earned an average of above 2.00. A student placed on probation for a third period, whether successive or after an interval, will be suspended.

Suspension

A student who has attempted 12 or more semester hours of work and whose quality-point index is below 1.50 is subject to suspension; however, a student who has a quality-point index between 1.40 and 1.50 will be considered by the Committee on Scholarship, which may retain him on probation or suspend him.

A student who is subject to probation for the third time, whether successive or after an interval, will be suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. In applying for readmission he must submit specific evidence to the Committee on Scholarship that he is better qualified to pursue college work. A student suspended twice for poor scholarship will not be readmitted.

Readmission

A student who withdraws, is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return. Forms for readmission may be obtained from the Office of Admissions of the University. Complete and official transcripts from each institution the student has attended since making his previous application must be sent to the Office of the Director of Admissions before his application for readmission can be evaluated.

CHANGES IN PROGRAM OF STUDIES

Dropping a Course Off-Campus

Courses meeting once or twice a week for 2½ hours may be dropped without academic penalty during the first 10 class periods, and courses meeting once or twice a week for 1¼ hours may be dropped without academic penalty during the first 20 class periods.

Withdrawing from a course without academic penalty after the 10th or 20th class meeting, as the case may be, requires approval of a written request, which should be addressed to the Dean of the College of General Studies.

Procedure for dropping courses.—An *Off-Campus* drop slip (obtainable from the instructor, training officer, or the College of General Studies) must be filled out;

signed and dated by the instructor; and submitted, in person or by mail, to the College of General Studies, 706 Twentieth Street NW., Washington 6, D. C.

Notifying an instructor of the intention to drop a course does *not constitute an official withdrawal.* Failure to follow the proper procedure will result in an automatic grade of *F* and, regardless of the time of discontinuance, will not relieve the student of financial responsibility for the entire course. (See "Refund of Fees" page 23.)

Dropping a Campus Course

A *Campus* drop slip (available at the Office of the Dean) must be filled out; signed and dated by the instructor; and submitted in person or by mail to the College of General Studies, 706 Twentieth Street NW., Washington 6, D. C.

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

Transfer Within the University

Transfer to the College of General Studies, as a degree candidate, from another college, school, or division of the University may be made only with the approval of the deans concerned. Application for transfer should be made on the transfer form, which is available at the Office of the Director of Admissions. An insert form, obtainable at the College of General Studies, must also be filled out. Upon transfer the student should consult the Dean and understand clearly the requirements he must fulfill.

A maximum of 45 semester hours is transferrable toward an Associate's degree; 90, toward a Bachelor's degree; and 18, toward a Master's degree. Students transferring within the University are advised to note the residence requirements of the degree sought.

Credit

Credit toward a degree is given only after regular registration for and satisfactory completion of the required work of classes in the University, or upon the granting of advanced standing in accordance with the regulations of the College of General Studies.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

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* The University work week is Monday through Friday, inclusive.

GRADUATION REQUIREMENTS

To be recommended for graduation a student must have met the admission requirements of the College, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation when registering for the last semester of course work needed to complete the degree requirements. This form should be attached to the final registration forms or mailed to the College of General Studies. The graduation fee should not be included; the student will be billed by the Cashier prior to Commencement.

Scholarship.—The undergraduate must have a general quality-point index of 2.00. Candidates for the Bachelor's degrees must, in addition have a quality-point index of 2.50 in the major. The graduate student must attain a grade of *E* (excellent) in at least 6 semester hours of the total course requirements for the degree and the grade of *S* (satisfactory) in all other courses.

Curriculum.—See the requirements for the degree concerned.

Residence.—A student is "in residence" only when registered for course work after making application for admission to degree candidacy or for the 6 semester hours undertaken to qualify for degree candidacy (see the specific residence requirements for the degree concerned).

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

If there is an interruption in the residence status, the student must apply for readmission to degree candidacy and meet any changes in curriculum which have been made since his original admission.

With the permission of the Dean, a student may be granted leave of absence; such student should, however, remain technically in residence by paying the residence fee for each semester he is absent. For the purpose of this regulation, the summer session will be disregarded.

By special arrangement, service personnel who receive military transfers when they are within 6 hours of a degree, may be permitted to complete their work elsewhere, transfer these credits to the College of General Studies, and receive a degree from this University. This procedure does not apply to Master's candidates who have been granted 6 hours of transferred credit.

Graduate Record Examination.—During the senior or final year candidates for the Bachelor's degrees in the College of General Studies are required to take the Graduate Record Examination: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities. The examinations are conducted by the University twice a year: the Fall Testing Session (December 8, 1962) for students graduating in February, and the Spring Session (April 6, 1963) for those graduating in June or those completing academic requirements during the summer session.

As a part of registration for the final semester of undergraduate study, each student is responsible for applying for the Graduate Record Examinations. Application is to be made on the appropriate form and sent to the Assistant Dean, College

of General Studies, together with a check or money order for $10, made out to The George Washington University.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission, students who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis.—A thesis, submitted in partial satisfaction of requirements for the Master's degree, must be submitted in its final form to the Dean no later than the date specified in the calendar. Three complete copies of each thesis are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis. These regulations are rigidly enforced. (See page 41.)

Accepted theses, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean. The application should be in duplicate, should state the reason for the request, and give the address to which the diploma is to be sent. Petition for graduation *in absentia* should be received in the Office of the Dean at least two weeks prior to graduation.

Honors

Dean's List.—To be eligible for inclusion on the Dean's List, a student must be a candidate for an undergraduate degree in the College of General Studies. Course work taken while the application for admission is being processed and the 6 semester hours required prior to making application will be computed in determining eligibility for the Dean's List. A full-time degree candidate must have a minimum quality-point index of 3.50 for the semester concerned; a part-time degree candidate must have a quality-point index of 3.50 on the last 12 semester hours of work and must have maintained continuous registration for at least one three-hour course during the period concerned. Eligibility for inclusion again will be determined on the basis of the subsequent 12 semester hours of work.

With distinction.—The undergraduate degrees may be conferred "with distinction", at the discretion of the Dean's Council of the College and the Committee on Scholarship of the University, if a student attains a quality-point index of 3.50 or higher on all work taken at this University. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.

3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.

4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Dishonesty

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Dean's Council) for subsequent registration in any unit of the University.

Evidence of dishonesty on the part of any student will result in his suspension by the Dean upon recommendation of the Dean's Council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for all courses in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in computation of the quality-point index.

If a student suspended because of academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the quality-point index.

THE LIBRARY

A student registered in the College of General Studies is entitled to the reference use of the University Library. A library card is issued to each student.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

VETERANS EDUCATION

The George Washington University is approved to provide training for eligible persons under the provisions of Public Laws 634, 190, 550, 16, and 894. The Office of Veterans Education, Building Q, 2029 H Street NW. (Telephone: FEderal 8-0250, Extension 334) operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration. Here information may be obtained concerning the educational program of the University and the procedures for securing educational benefits under the GI and War Orphans bills.

Eligible persons are advised to consult the Office of Veterans Education at the University concerning the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D. C.

Public Law 634 (War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

Public Law 190 (World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

Public Law 550 (Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950, and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

Public Laws 16 and 894 (Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

COUNSELING

Students in the College of General Studies may obtain counseling and assistance in program planning in the offices of the College or from representatives of the Off-Campus Division at the installations and agencies at which courses are held. Appointments may be made by calling the College of General Studies: FEderal 8-0250.

Extension 441; or through the Education or Training Officer at individual installations. University counselors are also available at all installations and agencies during announced registration periods and, in the installations and agencies, at a scheduled time each month.

Testing and Counseling Center

Ewing Lakin Phillips, Ph.D., *Director*

In addition, the services of The George Washington University Testing and Counseling Center are available to all students in the College of General Studies. The counseling services are designed to assist individuals in making educational and vocational plans. The program requires 30 hours of testing, scheduled in a series of three or four appointments. During this time, information concerning past experience, general ability, interest, personality, aptitudes, and achievement is obtained. Test results are interpreted and their implications discussed with the client. The Center is prepared to furnish related occupational and educational information. Clients are referred for specialized services when required. Follow-up is provided if requested.

The services offered by the Center include: aid in vocational choice; checking present training objectives; diagnosis of academic difficulties; checking suitability of present job; and special testing services, including General Educational Development Tests and Miller Analogies Test.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is $7.50; for students currently enrolled in the University but not as degree candidates, the fee is $30; for graduates of the University, $30; for community clients, $45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

Appointments may be made by phone, mail, or in person. The Center is open from 9:00 to 5:00 Monday through Friday. The office is in Building N, 718 Twenty-first Street NW., Washington 6, D. C. Telephone: FEderal 8-0155 (or FEderal 8-0250, Extension 463).

THE ASSOCIATE'S DEGREES

Four Associate's curricula are available: the Associate in Arts curriculum which constitutes the first two years of the Bachelor of Arts curriculum (see pages 32–33) and the three Vocational Curricula—(1) Associate in Arts with a major in Accounting, (2) Associate in Science, (3) Associate in Secretarial Administration. The Vocational Curricula are terminal.

Students who plan to continue working in this College toward the Bachelor's degree must apply to the Dean upon completion of requirements for the degree of Associate in Arts (which is optional). Forms for this purpose are available at the Office of the Registrar and the College of General Studies.

After completing the College of General Studies requirements for the degree of Associate in Arts, students may wish to transfer to one of the other schools or colleges within the University, or they may wish to transfer to another institution. However, modifications in admission, advanced standing, and curriculum require-

ments permitted by the College of General Studies may not be accepted in transfer. Therefore, while registered in the College of General Studies, students should meet the requirements of the college or university to which they wish to transfer. The entrance requirements of the colleges and schools of the University are stated in the general catalogue of the University, which is available at the Office of the Director of Admissions.

Advanced Standing

A maximum of 30 semester hours of advanced standing toward the degrees of Associate in Arts and Associate in Secretarial Administration may be earned, as explained in detail on page 21.

REQUIREMENTS FOR THE DEGREES

A minimum of 50 per cent of the work for the degree must be completed off campus; a maximum of 50 per cent may be completed on campus.

Residence

At least the last 15 semester hours for the degree must be completed while registered as a degree candidate (see page 27) in the College of General Studies. In both the Off-Campus Division and the Campus Division, the 6 semester hours required prior to admission to degree candidacy are accepted in partial satisfaction of the residence requirement, if the courses are approved as part of the student's degree program. (See pages 20–21.)

Scholarship

The system of grading and computing scholarship is described in detail on page 24. For regulations concerning probation, suspension, and readmission, see page 25.

Curriculum

The satisfactory completion of 60 semester hours is required, as outlined in one of the following curricula.

ASSOCIATE IN ARTS CURRICULUM

The following curriculum leads to the degree of Associate in Arts and constitutes the first half of the Bachelor of Arts curriculum. For the second half, see pages 36 and 37.

Faculty Adviser: Robert Whittington Eller, B.S., A.M. in Ed., Assistant Dean of the College of General Studies. Building F, Room 12 (706 Twentieth Street N.W.), FEderal 8-0250, Extension 487 or 441.

	Semester Hours
English I (or 1X)–2: English Composition	6
English 41–42: Introduction to World Literature; 51–52: Introduction to English Literature; 71–72: Introduction to American Literature; or Philosophy 51–52: Introduction to Philosophy	12
*Foreign Language	

* A student offering for admission four acceptable high school units in one foreign language or two units in each of two foreign languages is not required to take any foreign language. (A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of classroom work.) If he offers two units only, he must complete the entire second-year college course in the same language or the first-year college course in another language. The usual college requirement is two years of a single language, but since many College of General Studies students may subsequently be stationed abroad, some familiarity with two foreign languages may be particularly useful. Therefore students may take one year each of two different foreign languages. Those who transfer to other institutions will probably have to take two years of one language and should be guided accordingly.

The high school units accepted under the above arrangements remove the college language requirement, but do not count for college credit

Social Studies: from economics, history, political science, sociology and anthropology, or Geography 51 and 52. Six hours in one department are required, unless Political Science 9 and Sociology 2 are satisfied by the GED tests	6
Science: Chemistry 3–4: Fundamentals of Physical Science, or an introductory course in biology†, geology, or physics (if arrangements cannot be made to offer such courses off campus, students may take these courses on campus)	6 or 8
Elective	22 to 24
Total	60

VOCATIONAL PROGRAMS

The following two-year terminal curricula are designed for students who do not wish to extend their college education beyond two years.

ASSOCIATE IN ARTS CURRICULUM

In Accounting

The advanced standing possible in this curriculum is limited to English 2 and the 6 semester hours of electives, which may be earned by satisfactory scores on the appropriate GED tests. (See page 21.)

Faculty Adviser: Ralph Dale Kennedy, Ph.D., Professor of Accounting. Hall of Government, Room 103 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 243, 610

	Semester Hours
Acct 1–2: Introductory Accounting	6
Acct 101: Cost Accounting	3
Acct 111: Financial Statement Analysis	3
Acct 121–22: Intermediate Accounting	6
Acct 161: Income Tax Accounting	3
Acct 171: Auditing	3
Acct 181: Accounting Systems	3
Acct 191: Advanced Accounting	3
Acct 193: Business Budgeting	3
BA 131: Business Finance	3
BA 161: Commercial Law: Contracts, Sales, Agency, and Bailments	3
BA 162: Commercial Law: Negotiable Instruments, Property, Mortgages	3
Econ 1–2: Principles of Economics	6
Engl 1 (or 1X)–2: English Composition	6
Elective (To be selected with the approval of the adviser)	6
Total	60

ASSOCIATE IN SCIENCE CURRICULUM

The curriculum leading to the degree of Associate in Science in the field of Physical Sciences is offered at the Naval Engineering Experiment Station, Annapolis, Maryland, by the College of General Studies and on campus by the Columbian College of Arts and Sciences. Students who have taken courses in this curriculum at installations where the entire program is not available may, if they meet the entrance requirements, transfer to Columbian College of Arts and Sciences to complete the curriculum.

No credit toward the degree will be granted for GED tests, service schools, correspondence courses, or extension courses.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

respondence schools, or validating examinations. All students interested in continuing the study of physical science toward a Bachelor's degree should consult the Dean or Assistant Dean of the College of General Studies.

Faculty Adviser: Robert Whittington Eller, B.S., A.M. in Ed., Assistant Dean of the College of General Studies. Building F, Room 12 (706 Twentieth Street NW.), FEderal 8-0250, Extension 441 or 487

	Semester Hours
Chem 11–12: General Chemistry	8
Chem 21: Qualitative Inorganic Analysis	4
Engl 1 (or 1X)–2: English Composition	6
Engl 11: The Writing of Reports	3
*Math 3: College Algebra	3
*Math 6: Plane Trigonometry	3
Math 21: Calculus I	3
Math 22: Calculus II	3
Math 23: Calculus III	3
Math 24: Calculus IV	2
ME 10: Graphical Communications	3
Physics 11: Introductory Physics	9
Physics 14, 15, 16: General Physics	
Electives (Speech 1: Effective Speaking (3) and Economics 1–2: Principles of Economics (6) are recommended)	7
Total	60

ASSOCIATE IN SECRETARIAL ADMINISTRATION CURRICULUM

This curriculum is designed for secretarial students who, in addition to obtaining the degree of Associate in Secretarial Administration, wish to prepare for the Certified Professional Secretaries' Examination for the certificate issued by the Institute for Certifying Secretaries, a body of the National Secretaries Association, International.

The status of applicants with academic work taken at another institution will be established on application for degree candidacy.

Faculty Adviser: Mildred Hollander Shott, A.M., Associate Professor of Secretarial Studies. Monroe Hall, Room 300 (2115 G Street NW.), FEderal 8-0250, Extension 447

	Semester Hours
Acct 1–2: Introductory Accounting	6
BA 102: Fundamentals of Management	3
BA 109: Office Management	3
Econ 1–2: Principles of Economics	6
Engl 1 (or 1X)–2: English Composition	6
Engl 41–42: Introduction to World Literature;	6
Engl 51–52: Introduction to English Literature; or	3
Engl 71–72: Introduction to American Literature	3
Psych 1: General Psychology	3
Sec Studies 2: Intermediate Typewriting	3
Sec Studies 11: Elementary Shorthand and Transcription	3
Sec Studies 12: Intermediate Shorthand and Transcription	3
Sec Studies 15: Advanced Shorthand, Typewriting, and Transcription	3
Sec Studies 16: Secretarial Shorthand, Typewriting, and Transcription	3
Sec Studies 51: Business Correspondence	3
Sec Studies 54: Secretarial Practice	3

* The Mathematics 3 requirement may be satisfied by two years of acceptable high school algebra; the Mathematics 6 requirement, by one-half year of high school trigonometry.

Speech 1: Effective Speaking or Speech 11: Voice and Diction	3
Stat 51: Introduction to Business and Economic Statistics (3), or Statistics 101: Basic Principles of Statistical Methods I (3)	3
Total	60

THE BACHELOR'S DEGREES

Programs are offered which lead to the degrees of Bachelor of Arts, Bachelor of Business Administration, and Bachelor of Science in Cartography.

BACHELOR OF ARTS

Work leading to the degree of Bachelor of Arts is available according to two types of programs: (1) with a major in the General Studies Curriculum and (2) with a departmental major. Many courses required for departmental majors are available only on campus.

REQUIREMENTS FOR ADMISSION TO CANDIDACY

The degree of Associate in Arts in the College of General Studies, or the equivalent, and the permission of the Dean (see pages 20–21) are required. Admission to Bachelor's candidacy after receiving the degree of Associate in Arts is not automatic. With the permission of the Dean, students with limited deficiencies in the requirements for admission may be conditionally admitted to degree candidacy while they make up academic deficiencies.

Students with acceptable college records from other institutions must complete 6 semester hours, with the grade of *C* or better, before applying for degree candidacy.

Students with questionable previous college records may be accepted on probation, in an "unclassified" status, to complete 24 semester hours, with the grade of *C* or better, before final consideration of degree candidacy.

A conference concerning plans for study is required of each applicant for admission to candidacy. Appointments may be made with the Assistant Directors or the Director of the Off-Campus Division by telephone (FEderal 8-0250, Extension 441) or by letter.

Advanced Standing

In addition to credit allowed in transfer from other accredited colleges or universities, see "From Higher Institutions", page 20, advanced standing may be obtained by the following methods.

1. By validating examinations, service schools, and correspondence courses. From any combination of these sources, the maximum credit that may be obtained is 30 semester hours. The maximum credit obtained from any one of these sources may not exceed that stated on page 21. No credit may be obtained in this way, however, if the student has been credited with the maximum of 30 semester hours toward the degree of Associat in Arts.

2. By GED* tests (see pages 21, 33, 39). Advanced standing is limited to students registered in the General Studies Curriculum or the Business Administration Curriculum and is granted only for courses which are prerequisite to advanced courses in the student's Bachelor's program.

* Available to military personnel at military installations only.

REQUIREMENTS FOR THE DEGREE

Residence

The last 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the College, unless special permission is granted by the Dean to take work elsewhere. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work and the 6 hours required prior to admission to degree candidacy (if approved as part of the degree program) may be counted in residence, but in no case may the period of residence aggregate less than 30 weeks. For regulations governing military students who are transferred when they are within 6 semester hours of their degree, see page 27.

Transfers.—Transfer students from other universities who have partially or substantially met the major requirements are required to complete satisfactorily 12 semester hours of approved work in the major field in the College of General Studies. This work will count as part of the minimum (30 semester hours) residence requirement. (For regulations concerning transfer within the University, see page 26.)

Scholarship

The system of grading and computing scholarship is described in detail on page 24. For regulations concerning probation, suspension, and readmission, see page 25.

To remain in good standing, a student must maintain a general quality-point index of 2.00 and a quality-point index of at least 2.50 in his major.

Curriculum

The satisfactory completion of 60 semester hours, as set forth in one of the following curricula, is required.

GENERAL STUDIES CURRICULUM

Preregistration counseling is recommended to adapt this curriculum to the student's objectives or employment responsibilities and aims. For appointments call the College of General Studies, FEderal 8-0250, Extension 441.

Students planning to work toward a Master's degree in Columbian College of Arts and Sciences; the School of Government, Business, and International Affairs; or the School of Education are advised to plan their programs of study toward the Bachelor's degree so that they will meet the prerequisite requirements of the school or college of their choice.

Candidates for the degree of Bachelor of Arts registered in the General Studies Curriculum select courses, approved by the Dean or Assistant Dean, from two of the following divisions, one of which constitutes the major and the other the minor.

Faculty Adviser: Robert Whittington Eller, B.S., A.M. in Ed., Assistant Dean of the College of General Studies. Building F, Room 12 (706 Twentieth Street NW.), FEderal 8-0250, Extension 441

1. *The Division of Languages and Literatures.*—The departments of Art, Classical Languages and Literatures, English, Germanic Languages and Literatures, Journalism, Romance Languages and Literatures, and Slavic Languages and Literatures.
2. *The Division of Mathematics and Physical Sciences.*—The departments of Chemistry, Geology, Mathematics, Physics, and Statistics.
3. *The Division of the Natural Sciences.*—The departments of Botany, Microbiology, Physiology, Psychology, and Zoology.

4. *The Division of the Social Sciences.*—The departments of Accounting, Business and Public Administration, Economics, Education, Geography, History, Philosophy, Political Science, Religion, Sociology and Anthropology, and Speech.

	Semester Hours
Major division (Courses are to be selected, with the approval of the adviser, from appropriate fields of study listed in the student's major division. Eighteen of the required 24 hours must be in courses with departmental numbers above 100.)	24
Minor division (Courses are to be selected, with the approval of the adviser, from appropriate fields of study listed in the student's minor division.)	12
Elective	24
Total (of which at least 30 semester hours must be in courses with departmental numbers above 100)	60

DEPARTMENTAL MAJORS

Students who elect a major of the type offered in Columbian College of Arts and Sciences and the School of Government, Business, and International Affairs should consult the catalogue of the appropriate school for requirements of a given major. Any deviation from these requirements must be approved by the chairman of the department concerned and the Dean of the College of General Studies.

BACHELOR OF BUSINESS ADMINISTRATION CURRICULUM

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance. Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512

The following curriculum leading to the degree of Bachelor of Business Administration is available to students in the College of General Studies only. Entrance and advanced standing requirements are the same as those stated on page 21. Residence and scholarship requirements for the degree are the same as those for the degree of Bachelor of Arts (see page 36).

	Semester Hours
Acct 1-2: Introductory Accounting	6
Acct 193: Business Budgeting	3
BA 101: Introduction to Business	3
BA 102: Fundamentals of Management	3
BA 105: Personnel Management	3
BA 131: Business Finance	3
BA 141: Principles of Marketing	3
BA 161: Commercial Law: Contracts, Sales, Agency, and Bailments	3
BA 162: Commercial Law: Negotiable Instruments, Property, Mortgages	3
BA 198: Case Problems in Management	3
Econ 1-2: Principles of Economics	6
Econ 121: Money and Banking	3
Engl 1, 2: English Composition	6
Engl 11: The Writing of Reports	3
[a]Foreign Language or Mathematics and Science	12
Foreign Language (see page 32, footnote) or Math 3: College Algebra (3) and Math 6: Plane Trigonometry (3) *and* Chem 3-4: Fundamentals of Science (4-4) or Physics 11, 12: Introductory Physics (3-3)	

[a] This option applies only to students in the College of General Studies.

Pol Sc (1 and 9, 1 and 10, 9–10)	6
Pol Sc 1: Introduction to Government (3)	
Pol Sc 9–10: Government of the United States (3-3)	3
Speech 1: Effective Speaking	3
Stat 51: Introduction to Business and Economic Statistics	30
†Elective (Students interested in Foreign Commerce include Geography 51)	
	105
‡Group Option (To be selected from one of the following groups)	15
Total	120

Group Option†.—The selection of the option and the courses (15 semester hours) to be taken in it must be made in consultation with the faculty adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained if the student wishes such modification of his option group.

Group I—General Business
Composed of courses in Accounting, Business and Public Administration, Economics, and Statistics.

Group II—Personnel
Composed of courses in Business and Public Administration, Economics, Psychology, Speech, and Statistics.

Group III—Finance
Composed of courses in Accounting, Business and Public Administration, Economics, Political Science, and Statistics.

Group IV—Marketing, Procurement, and Production
Composed of courses in Business and Public Administration, Economics, Geography, and Statistics.

Group V—Controllership
Composed of courses in Accounting, Business and Public Administration, and Economics.

Group VI—Economics
Composed of courses in Economics and Business and Public Administration.

Group VII—Statistics
Composed of courses in Statistics.

Group VIII—Transportation and Public Utilities
Composed of courses in Business and Public Administration, Economics, Geography, History, and Statistics.

Group IX—Automatic Data Processing
Composed of courses in Accounting, Business and Public Administration, Economics, Electrical Engineering, Mathematics, and Statistics.

Foreign Commerce.—Business Administration majors who wish to specialize in foreign commerce may request a modification of the above requirements. The modified major excludes some of the above required courses and adds others, such as a third year of foreign language, foreign markets, exporting and importing, economic geography, and other courses relating to overseas trade. Each program must be approved by the adviser.

BACHELOR OF SCIENCE IN CARTOGRAPHY

The College of General Studies offers a four-year curriculum designed to prepare students for the degree of Bachelor of Science in Cartography.

ENTRANCE REQUIREMENTS

The entrance requirements are the same as those stated on pages 19–21, with the exceptions noted below under "Advanced Standing."

† To be selected in consultation with the Chairman of the Department of Business and Public Administration.

‡ Lists of courses suggested for each option may be obtained from the Assistant Dean of the College of General Studies or the Chairman of the Department of Business and Public Administration.

Advanced Standing

Twenty-four semester hours of credit may be granted upon the success-ful completion of validating examinations. No credit will be given for GED tests, correspondence schools, or service school courses.

REQUIREMENTS FOR THE DEGREE

The residence and scholarship requirements for the degree of Bachelor of Science in Cartography are the same as those stated on page 36 for the degree of Bachelor of Arts.

Curriculum

To be recommended by the faculty for graduation, candidates for the degree of Bachelor of Science in Cartography are required to complete the following curriculum of 130 semester hours.

Faculty Adviser: Robert John Alexander, M.S., Lecturer in Cartography. Building I, Room 202 (2135 G Street NW.), FEderal 8-0250, Extension 287 or 298

	Semester Hours
Cart 1: Map Interpretation	3
Cart 11: Cartographic Drafting and Descriptive Geometry	3
Cart 12: Topographic Surveying	3
Cart 13: Higher Surveying	3
Cart 17–18: Elementary Photogrammetry	6
Cart 110: Map Projections	2
Cart 111: Map Reproduction	1
Cart 155: Elements of Geodesy	3
Cart 156: Geodetic Astronomy	3
Cart 160: Theory of Errors and Geodetic Adjustments	3
Cart 191–92: Map and Chart Construction	6
Chem 11–12: General Chemistry	8
Engl 1 or 1X: English Composition	3
Engl 2: English Composition	3
Geog 51: Introduction to Geography	3
Geog 52: World Regions	3
Geog 115–16: Physical Geography	6
Geog 124: Land Capabilities	3
Geog 125: Transportation Complexes	3
Geol 105–6: Fundamentals of Geophysics	6
Math 21: Calculus I	3
Math 22: Calculus II	3
Math 23: Calculus III	3
Math 24: Calculus IV	3
Math 111: Mathematics for Engineers and Physicists I	3
Math 112: Mathematics for Engineers and Physicists II	3
Oceanog 101–2: Introductory Oceanography	6
Phys 11: Introductory Physics	3
Phys 14: General Physics	3
Phys 15: General Physics	3
Phys 16: General Physics	3
Social Studies: (any one of the following two-semester courses)	6
Econ 1–2: Principles of Economics (3–3)	
Hist 39–40: The Development of European Civilization (3–3)	
Hist 71–72: The Development of the Civilization of the United States (3–3)	
Pol Sc 9–10: Government of the United States (3–3)	
Anthro 1, Soc 2: Man, Culture, and Society (3–3)	
Electives	14
Total	130

THE MASTER'S DEGREES

Master of Arts curricula in the fields of Financial Management, Governmental Administration, and Personnel Administration are offered for adults with successful work experience who find it essential to take most of their graduate studies off-campus. This program is available in the Main Navy Building, the Pentagon, Fort Monroe, Fort Eustis, Fort Meade, Langley Air Force Base, Annapolis, the Naval Supply Center at Norfolk, and the Social Security Administration Headquarters; and it will be offered elsewhere as the demand warrants. Additional curricula will be established when the need becomes apparent.

All the work in these three curricula may be taken off-campus. If it should become necessary, up to 50 per cent of the courses may be taken on campus. In all cases the University standards for graduate study are maintained.

A curriculum leading to the degree of Master of Arts in International Affairs is offered for the students and faculty of the Air War College, the Army War College, the National War College, the Naval War College, and the Central Intelligence Agency.

A curriculum leading to the degree of Master of Business Administration is offered for the students and faculty at the Industrial College of the Armed Forces and the Command and Staff College of Air University.

A curriculum leading to the degree of Master of Public Administration is offered for students and faculty at the Command and Staff College of Air University.

The programs in International Affairs and Business Administration are offered only at these military installations or in the Campus Division of the College of General Studies.

Graduate students who plan to work toward Master's degrees in another school or college of the University may enroll for graduate courses in the Off-Campus Division with the approval of the dean of the school or college in which they are enrolled. In the School of Government, Business, and International Affairs and the School of Education, a maximum of 6 hours of *approved* off-campus work will be accepted at the time of matriculation for the degree and 6 additional hours of approved courses will be permitted off-campus after matriculation.

COUNSELING SERVICE

An advisory service, which is the joint responsibility of the agency sponsoring the program and the University, is available to all Master's candidates. Regular members of the Faculty of the University are available as curriculum advisers in the various specialized fields.

REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY

To be admitted to degree candidacy the applicant must have (1) an approved Bachelor's degree (120 semester hours, which conform essentially to the requirements for a Bachelor's degree in the College of General Studies) from an accredited higher institution; (2) credit (totaling 6 semester hours), with the grade of *B* (undergraduate) or *S* (graduate), for two courses approved by the academic adviser and taken in the College of General Studies prior to admission to candidacy*; and (3) a quality-point index of 3.00 (*B*) in the undergraduate major. If the applicant's work history gives evidence of more competence than his previous academic

* See footnote on page 41.

record indicates, he may be admitted to candidacy on the basis of satisfactory completion of 12 semester hours of work approved by his academic adviser, acceptable results of scholastic aptitude tests, or both.*

Advanced Standing*

A maximum of 6 semester hours of advanced standing may be credited toward the degree by transfer of credit for approved graduate work taken at an accredited college or university.

REQUIREMENTS FOR THE DEGREES

Residence

Of the required semester hours of graduate work for the degree, a minimum of 24, which may include the thesis (6 semester hours), must be completed while registered as a degree candidate in the College of General Studies, except in the case of transfers within the University, who are required to have 12 hours of residence in the College of General Studies as degree candidates.

Scholarship

The grade of *E* (excellent) must be attained in at least 6 semester hours of the course requirements for the degree.

A student whose scholarship is unsatisfactory may be suspended by the Dean upon recommendation of the Committee on Scholarship. A Master's candidate who accumulates 9 hours or more of *U* (unsatisfactory) (including grades of *C* or lower in prerequisite courses) will be automatically suspended. Regarding the system of grading, see page 24.

Thesis

Theses are required of candidates for the degrees of Master of Arts in International Affairs, Master of Business Administration, and Master of Public Administration.

With the approval of the adviser, a thesis may be substituted for six hours of elective credit toward the degree of Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration. (See page 28.)

The thesis subject must be approved by the director of the thesis and the faculty adviser and presented to the Dean no later than the date announced in the calendar.

The thesis in its final form must be approved by the director of the thesis and the faculty adviser and presented to the Dean no later than the date announced in the calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If preparation of the thesis extends beyond the two-year period the student must register for it again and pay tuition on the same basis as for a repeated course.

Course Substitution

For any course substitution it is the responsibility of the student to get written ap-

* Not applicable to candidates for the degrees of Master of Arts in International Affairs, Master of Business Administration, or Master of Public Administration.

proval from the faculty adviser and the Dean prior to registration. Forms for requesting course substitution are available at the College of General Studies.

Comprehensive Examinations

The Master's candidate is required to pass a written Comprehensive Examination. The examinations are conducted at the University: December 7 and 8, 1962, for students graduating in February 1963; April 5 and 6, 1963, for students graduating in June 1963. At the time of the examination he may be required to submit to the examination committee copies of articles published, pertinent staff studies, reports, etc., prepared during the period of graduate study, as additional evidence of Master's competency.

MASTER OF ARTS

The following programs of study are effective for all students admitted to Master's candidacy subsequent to September 1, 1962. Students admitted prior to September 1, 1962 are permitted to continue the program of studies in effect on the date of admission.

Prerequisite

A student must meet the general requirements for admission to degree candidacy as listed on pages 40–41. If he does not submit an acceptable undergraduate degree with a *B* average, or receive a grade of "Excellent" on two of the first four courses, he will be required to take additional course work as approved by the faculty adviser.

Plans of Study

Two plans of study lead to the degree of Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration. *Plan I* requires a minimum of 30 semester hours of graduate credit, including a thesis of 6 hours. Plan II requires a minimum of 33 semester hours of graduate credit, including a 3 semester hour course in Research Methods.

FINANCIAL MANAGEMENT

(Formerly Controllership)

Faculty Adviser: Arlin Rex Johnson, Ph.D., Professor of Business Administration
Hall of Government, Room 206 (710 Twenty-first Street NW.), FEderal 8-4000, Extension 493

Required Courses

The student must complete course work as approved by the Faculty Adviser from the following courses:

	Semester Hours
Acct 211–12: Managerial Accounting	6
BA 261: Seminar in Advanced Management	3
BA 275: Human Relations in Business	3
BA 296: Seminar in Controllership	3
BPA 268: Management Engineering	3
PA 213: Administration in Government	3
PA 251: Governmental Budgeting	3
PA 252: Seminar in Planning and Programming	3
Stat 101: Basic Principles of Statistical Methods I	3

Plan I	*Semester Hours*
Required courses	24
BA 299-300: Thesis	6
Total	30

Plan II	*Semester Hours*
Required courses	30
BPA 295: Research Methods	3
Total	33

Elective Courses

A student whose previous background makes it unnecessary for him to take all of the prescribed courses in this program may substitute elective courses, with the written approval of his faculty adviser. A form for this purpose is available at the College of General Studies. Electives may be selected from courses listed under the Personnel Administration Master's program (pages 44–45.) In exceptional cases, the faculty adviser may approve other courses as electives.

GOVERNMENTAL ADMINISTRATION

Faculty Adviser: Waldo Sommers, Ph.D., Professor of Public Administration. Hall of Government, Room 205 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 404 or 588

Required Courses

	Semester Hours
BPA 201: Advanced Administrative Management	3
BPA 206: Personnel Management	3
BPA 268: Management Engineering	3
Psych 144: Personnel Psychology or	
Psych 145: Principles of Human Relations	3
PA 237: Intermediate Management and Supervision	3
PA 251: Governmental Budgeting	3
PA 252: Seminar in Planning and Programming	3
PA 260: Seminar in Policy Formulation and Administration	3

Plan I	*Semester Hours*
Required courses	24
BA 299-300: Thesis	6
Total	30

Plan II	*Semester Hours*
Required Courses	24
BPA 295: Research Methods	3
Elective	6
Total	33

Elective Courses

A student whose previous academic preparation makes it unnecessary for him to take all of the prescribed courses in this program may substitute elective courses, with the written approval of the faculty adviser. A form for this purpose is available at the College of General Studies. Electives may be selected from courses listed under the Personnel Administration Master's program on pages 44–45. In exceptional cases, the faculty adviser may approve other courses as electives.

PERSONNEL ADMINISTRATION

Faculty Adviser: Joe Lee Jessup, M.B.A., Professor of Business Administration. Monroe Hall, Room 3-A (2115 G Street NW.), FEderal 8-0250, Extension 543

Required Courses

The student must complete at least one course in each of the five major areas:

	Semester Hours
1. *Personnel Principles*	
BA 209: Seminar in Personnel Management	3
BPA 206: Personnel Management	3
2. *Human Relations and Motivation*	
BPA 207: Human Relations in Administration	3
Psych 245: Seminar: Employee Motivation and Morale	3
3. *Labor Relations*	
Econ 241: Unionism, Collective Bargaining, and Labor Economics	3
Econ 244: Problems in Unionism, Collective Bargaining, and Labor Economics	3
4. *Management*	
BPA 201: Advanced Administrative Management	3
5. *Quantitative Methods*	
BPA 204: Quantitative Factors in Administration	3

Plan I	Semester Hours	Plan II	Semester Hours
Required Courses	15	Required Courses	15
Elective	9	Elective	3
Thesis: BA 299–300, PA 299–300, or Psych 299–300	6	BPA 295: Research Methods	3
Total	30	Total	33

Elective Courses

A student whose previous background makes it unnecessary for him to take all of the prescribed courses in this program may substitute elective courses with the written approval of the faculty adviser. A form for this purpose is available at the College of General Studies. Electives may be selected from courses listed below. In exceptional cases, the faculty adviser may approve other related courses as electives.

	Semester Hours
BPA 205: Seminar in Communication and Executive Action	3
BPA 262: Contemporary Administrative Theory and Practice	3
BPA 268: Management Engineering	3
BPA 287: Relation of Government to Business	3
BA 210: The Personnel Manager	3
BA 218: Introduction to Data Processing	3
BA 286: Management in the Armed Forces	3
BA 288: Executive Leadership	3
BA 291: Seminar in Business Management	3
BA 297: Case Studies in Business Administration	3
PA 211: Problems of Governmental Organization	3
PA 212: Case Studies in Public Administration	3
PA 221: Staff Functions in Government	3
PA 232: Federal Personnel Procedures	3
PA 233: Seminar in Manpower Development and Utilization	3
PA 251: Governmental Budgeting	3
PA 260: Seminar in Policy Formulation and Administration	3
PA 261: Public Opinion and the Administrator	3
PA 272: Seminar in Public Personnel Administration	3
Econ 246: Foreign Labor Movements	3
Ed 257: Occupational and Educational Information	3
Ed 258: Techniques of Counseling	3

Ed 263:	Employee Training	3
Psych 131:	Psychological Tests	3
Psych 144:	Personnel Psychology	3
Psych 209:	Seminar: Psychology of Motivation	3
Psych 231:	Test Construction	3
Psych 244:	Seminar: Job Analysis and Evaluation	3
Psych 246:	Seminar: Personnel Measurement Techniques	3
Psych 254:	Seminar: Group Dynamics	3
Psych 255:	Seminar: Techniques of Opinion and Attitude Measurement	3
Psych 264:	Sensitivity Training: Human Relations Laboratory Course	3
Psych 265:	Theory and Design in Human Relations Training	3
Psych 267:	Theories of Organization	3
Stat 104:	Statistics in Psychology and Education	3

THE DEGREE OF MASTER OF ARTS IN INTERNATIONAL AFFAIRS

Faculty Adviser: John Withrow Brewer, Ph.D., Professor of International Law. Hall of Government, Room 204 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 240.

This is a special degree program offered in cooperation with the Air War College, Air University, Maxwell Air Force Base, Montgomery, Alabama; the Army War College, Carlisle Barracks, Pennsylvania; the National War College, Fort McNair, Washington, D. C.; and the Naval War College, Newport, Rhode Island. It is open only to current students and faculty and to graduates of the classes of 1957 through 1960 of these colleges.

Prerequisite

A Bachelor's degree based on a minimum of 120 semester hours from an accredited college or university.

Required Courses

		Semester Hours
Pol Sc 260:	Fundamentals of National Power*	3
Pol Sc 261:	International and United States Foreign Policy*	3
Pol Sc 262:	National Security Policy of the United States*	3
Pol Sc 299–300:	Thesis	6
Elective (from the following or related courses as approved by the faculty adviser)		15
Econ 251:	Theories of Economic Development (3)	
Hist 246:	Seminar in Eurasian History (3)	
Pol Sc 172:	International Organization: the United Nations (3)	
Pol Sc 212:	Seminar: Comparative Government and Politics (3)	
Pol Sc 283:	Topics in International Law (3)	
Pol Sc 285:	Diplomacy since World War II (3)	
Soc 263:	Culture, Contact, and Change (3)	
	Total	30

THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

These special degree programs are offered in cooperation with the Industrial College of the Armed Forces, Fort McNair, Washington, D.C., and the Command and Staff College, Air University, Maxwell Air Force Base, Montgomery, Alabama.

Prerequisite

A Bachelor's degree based on a minimum of 120 semester hours from an accredited college or university.

* War Colleges' curricula only.

INDUSTRIAL COLLEGE OF THE ARMED FORCES

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance. Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512

Open only to current students and faculty and to graduates of the classes of 1956 through 1960 of the Industrial College of the Armed Forces.

Required Courses

	Semester Hours
BPA 201: Advanced Administrative Management	3
BPA 268: Management Engineering	3
or BA 296: Seminar in Controllership	3
BPA 280–81–82: Managerial Aspects of National Security*	6
BA 299–300: Thesis	3
Econ 217: Survey of Economics	6
Elective (from the following or related courses as approved by the faculty adviser)	
BPA 207: Human Relations in Administration (3)	
BA 218: Introduction to Data Processing (3)	
BA 237: Investment Analysis (3)	
BA 288: Executive Leadership (3)	
PA 213: Administration in Government (3)	
PA 251: Governmental Budgeting (3)	
Econ 218: Survey of Economics (3)	
Econ 219: Managerial Economics (3)	
Total	30

AIR UNIVERSITY

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance. Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512

Open only to current students and faculty and to graduates of the class of 1962 of the Command and Staff College.

Required Courses

	Semester Hours
BPA 201: Advanced Administrative Management	4
BPA 204: Quantitative Factors in Administration	4
BPA 207: Human Relations in Administration	4
BPA 280–81: Managerial Aspects of National Security†	8
BA 297: Case Studies in Business Administration	4
BA 299–300: Thesis	6
Total	30

THE DEGREE OF MASTER OF PUBLIC ADMINISTRATION

(Air University)

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance. Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512

This is a special degree program offered in cooperation with the Command and Staff College, Air University, Maxwell Air Force Base, Montgomery, Alabama. It is open only to current students and faculty and to graduates of the class of 1962 of the Command and Staff College.

* Industrial College of the Armed Forces curriculum only.
† Command and Staff College, Air University curriculum only.

PREREQUISITE

A Bachelor's degree based on a minimum of 120 semester hours from an accredited college or university.

REQUIRED COURSES

	Semester Hours
BPA 201: **Advanced Administrative Management**	4
BPA 204: **Quantitative Factors in Administration**	4
BPA 207: **Human Relations in Administration**	4
BPA 280–81: Managerial Aspects of National Security*	8
PA 212: Case Studies in Public Administration	4
PA 299 300: **Thesis**	6
Total	30

OFF-CAMPUS CENTERS

The College of General Studies, through its Off-Campus Division, has offered programs in the various governmental and Armed Forces Installations listed below.

CENTRAL INTELLIGENCE AGENCY

WASHINGTON 25, D. C.

Training Officer: William C. Rein, Registrar
Building: Headquarters, Room GC-03
Telephone: 351-5513
Coordinator for the University: Donald T. McNelis
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts in International Affairs
Length of Courses: Fifteen weeks in fall and spring semesters; eight weeks in summer session
Restricted to CIA employees

CIVIL SERVICE COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association†)

Training Officers: William A. Hammill, Director of Personnel; John A. Simmons, Personnel Manager Supervisor
Building: Main Building, 8th and F Streets NW., Room 223 (Mr. Hammill); Room 217 (Mr. Simmons)
Telephone: DUdley 6-3434 (Mr. Hammill); DUdley 6-6118 (Mr. Simmons)
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

* Command and Staff College, Air University curriculum only.
† An organization of Federal Agencies situated in the Federal Triangle Area of downtown Washington, D. C.

ciate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Civil Service Commission and to personnel of other government agencies by permission

DEPARTMENT OF COMMERCE

Bureau of the Census, Washington 25, D. C.

Training Officers: John Vawter, Chief, Personnel Standards and Development Branch, Personnel Division; Mrs. Dorothy Paul Pritzker, Training Officer (General Field), Personnel Division

Building: FOB 3, Room 1370, Suitland, Maryland

Telephone: REdwood 5-2000, Extension 500

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to all employees of the Bureau of the Census and the Naval Hydrographic Office, and to other government employees by permission

Bureau of Foreign Commerce, Washington 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Donald O. Hayes, Career Development Officer; Mrs. Jane deLauder, Assistant Career Development Officer

Building: Commerce Department Building, Room 7416, 14th Street and Constitution Avenue NW.

Telephone: WOrth 7-3506 (Mr. Hayes); WOrth 7-2760 (Mrs. deLauder)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

Business and Defense Services Administration, Washington 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer; Walter F. Bayen, Employment Development Officer and Training Director

Building: Commerce Department Building, Room 4845, 14th Street and Constitution Avenue NW.

Telephone: WOrth 7-3514

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate

in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

COAST AND GEODETIC SURVEY, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Mrs. Muriel Christgau, Training Branch, Personnel and Safety Division, and Mr. Robert C. Czapiewski, Employee Development Officers
Building: Commerce Department Building, Room 2009, 14th Street and Constitution Avenue NW.
Telephone: WOrth 7-5034
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science in Cartography
Length of Courses: Fifteen weeks
Open to all employees of the Bureau of the Census and the Naval Hydrographic Office and to other government employees by permission

NATIONAL BUREAU OF STANDARDS, WASHINGTON 25, D. C.

Registrar: Mrs. Virginia Maxwell
Building: The Manse, Room 102, Connecticut Avenue and VanNess Street NW.
Telephone: EMerson 2-4040, Extension 366 or 7400
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Fifteen weeks
Open to all employees of the National Bureau of Standards—also to all employees of other government agencies and to all American citizens, providing they meet the formal prerequisites

PATENT OFFICE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Willis Hokans, Employee Development Officer
Building: Commerce Department Building, Room 3625, 14th Street and Constitution Avenue NW.
Telephone: WOrth 7-2871
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

Weather Bureau, Washington 25, D. C.

Training Officer: Albert V. Carlin, Chief, Training Section
Building: 4800 MacArthur Blvd., Room G108
Telephone: EXecutive 3-3111, Extension 4194
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Graduate courses in meteorology
Length of Courses: Fifteen weeks
Open to all government employees by permission of the Weather Bureau

DEPARTMENT OF DEFENSE

The Pentagon, Washington 25, D. C.

After-hours Training Program: John G. Boswell, Coordinator for the University
Room: Reception center on the Concourse
Telephone: OXford 7-3141 or FEderal 8-0250, Extension 487, 441
Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts, Associate in Secretarial Administration, and Bachelor of Arts; graduate program leading to the degree of Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration
Length of Courses: Fifteen weeks in Fall and Spring semesters; eight weeks in the Summer Sessions
Restricted to military and civilian personnel of the Department of Defense

Department of the Air Force

Air University Center

Maxwell Air Force Base, Montgomery, Alabama

Project Officer: Lt. Col. H. W. Meadville, USAF
Building: 800, Room 203
Telephone: 265-5621, Extension 74234
Coordinator for the University at Maxwell: John Littleton Boone Atkinson
Building: 1401
Telephone: 265-5621, Extensions 86113 and 86194
Liaison Officer for the University: R. C. Burns, Director of Institutes, Conferences, and Special Programs, College of General Studies
Telephone: FEderal 8-0250, Extension 441
Type of Courses Offered:
Air War College—Graduate program leading to the degree of Master of Arts in International Affairs
Command and Staff College—Undergraduate programs leading to the degrees of Bachelor of Arts and Bachelor of Business Administration; graduate program leading to the degrees of Master of Business Administration and Master of Public Administration
Length of Course: Fifteen weeks
Open to students and faculty of the Air War College and the Command and Staff College.

Langley Air Force Base, Virginia

Educational Consultant: Robert J. Dewey
Building: T-238

Telephone: PArk 2-7911, Extension 24120
Coordinator for the University: Andrew P. Rennie
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate courses leading to the degree of Master of Arts in the field of Personnel Management
Length of Course: Eight weeks and fifteen weeks
Open to military and civilian employees of the Air Force and to other government employees, by permission of the Commanding Officer of Langley Air Force Base

Department of the Army

Army Map Service, Washington 25, D. C.

Training Officer: Jerome E. McClain
Building: Erskine Hall, 6500 Brooks Lane NW.
Telephone: 986-2385
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degree of Bachelor of Science in Cartography
Length of Courses: Fifteen weeks
Open to employees of the Army Map Service and other government employees by permission of the Commanding Officer of the Army Map Service.

Army Security Agency, Arlington, Virginia

Education Officer: Lester E. Gross, Jr.
Building: T-300
Telephone: JAckson 5-5800, Extension 772
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 437
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Eight and fifteen weeks
Open to employees of the Army Security Agency

Army War College, Carlisle Barracks, Pennsylvania

Project Officer: Col. Daniel E. Helpin, USA
Building: Root Hall, Room 122
Telephone: CHapel 3-4141, Extension 360
Coordinator for the University at Carlisle Barracks: C. Edward Galbreath, Director, Army War College Center
Building: Root Hall, Room 115
Telephone: CHapel 3-4141, Extension 315
Liaison Officer for the University: R. C. Burns, Director of Institutes, Conferences, and Special Programs, College of General Studies
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Arts in International Affairs
Length of Courses: Fifteen weeks
Open to students and faculty of the Army War College

Fort Belvoir, Virginia

Educational Adviser: Eric Eber
Building: E-33
Telephone: EDgewater 9-5500, Extension 27154
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts, Bachelor of Arts, Bachelor of Science in Cartography; graduate program leading to the degree of Master of Business Administration
Length of Courses: Eight and fifteen weeks
Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Belvoir

Fort Detrick, Frederick, Maryland

Training Officer: Miss Veronica Catlett
Building: Civilian Personnel Office
Telephone: MOnument 3-4111, Extension 5147
Type of Course Offered: Business Management and Biochemistry courses
Length of Courses: Fifteen weeks
Open to civilian employees of Headquarters, Fort Detrick

Fort Eustis, Virginia

Educational Adviser: John Williams
Building: Educational Development Services, Building S-711
Telephone: TRinity 7-1311, Extension 22586 or 21121
Coordinator for the University: Andrew P. Rennie
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Arts in the field of Personnel Administration
Length of Courses: Eight and fifteen weeks
Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Eustis

Fort McNair, Washington 25, D. C.

(Undergraduate Program)

Educational Adviser: Miss Margaret Lockwood
Building: Post Education Center, Building 20A, Second Floor
Telephone: JAckson 7-9400, Extension 268.
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Eight and fifteen weeks
Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort McNair

Fort George G. Meade, Maryland

Training Officer: Gustaf E. Berglund
Building: 393, 7th Street between Chisholm and Chamberlin Avenues

Telephone: ORchard 47141, Extension 6421
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Army and to other government employees by permission of the Commanding Officer of Fort George G. Meade

Fort Monroe, Virginia

Educational Adviser: Paul Rahenkamp
Building: Education Center, Fort Monroe
Telephone: 727-3692
University Area Representative: Robert J. Dewey
Building: T-238, Langley Air Force Base
Telephone: PArk 2-7911, Extension 24120 or 21160
Coordinator for the University: Andrew P. Rennie
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts in the field of Personnel Administration
Length of Courses: Undergraduate courses, eight weeks; graduate courses, fifteen weeks
Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Monroe

Fort Myer, Virginia

Educational Adviser: Miss Margaret Lockwood
Building: Post Education Center, Building 604, South Area
Telephone: JAckson 7-9400, Extension 268
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Eight and fifteen weeks
Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Myer

Department of the Navy

Main Navy Building, Washington 25, D. C.

Training Officers: Edward Goemaat, Head, Training Branch, DCPD; Raphael C. Stringer, Head, Professional and Academic Programs Section; Miss Kathleen V. Sullivan, Training Specialist
Building: Main Navy Building, Room 1111, Constitution Avenue at 18th Street NW.
Telephone: OXford 6-6155
After-hours Training Program: Jack W. Charles, Coordinator for the University
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate courses leading to the degrees of Associate

in Arts, Associate in Secretarial Administration, and Bachelor of Arts; graduate program leading to the degree of Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Department of Defense

Bureau of Naval Personnel, Washington 25, D. C.

Training Officers: Cmdr. R. H. Robeson, Jr., USN, Head, Officer Education and Training Branch; DeWitt Fisher, Deputy Head; Paul L. Frantz, Special Programs Coordinator

Building: Arlington Annex, Room 3713

Telephone: OXford 4-2403 or 4-2776

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special courses in Human Relations and Management, Public Speaking for Naval Personnel, and Foreign Languages

Length of Courses: Fifteen weeks

Open to military personnel on active duty in the Department of the Navy by quota assigned to the various bureaus and offices, and to civilian employees of the Department by permission

Bureau of Naval Weapons, Washington 25, D. C.

Training Officers: S. P. Dudzik, Head, Employee Training and Development Section; Mrs. Honorah B. Peter, Training Officer

Building: Munitions Building, Room 2122, Constitution Avenue at 20th Street NW

Telephone: OXford 6-7341

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special courses in Human Relations and Management

Length of courses: Fifteen weeks

Open to civilian and military personnel on active duty in the Bureau of Naval Weapons by quota assigned to the various divisions and offices, and to civilian employees of the Department of the Navy by permission

Bureau of Ships, Washington 25, D. C.

Training Officer: Mrs. Edna K. Trudeau, Employee Development Officer

Building: Main Navy Building, Room 1427, Constitution Avenue at 18th Street NW.

Telephone: OXford 6-2027

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Graduate program leading to the degree of Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Department of Defense

Bureau of Yards and Docks, Washington 25, D. C.

Training Officers: Robert J. Wilson, Head, Training Section; E. R. Settle, Training Officer

Building: Yards and Docks Annex, Room 2B-37, Memorial Drive and H Road, Arlington, Virginia
Telephone: OXford 5-4367
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Courses: Graduate program leading to the degree of Master of Arts in the fields of Financial Management, Governmental Administration, and Personnel Administration
Length of Course: Fifteen weeks
Open to military and civilian personnel and to other government employees, by permission of the Commanding Officer

David Taylor Model Basin, Carderock, Maryland

Training Officer: William H. Struhs, Jr., Head, Training Branch
Building: 13, Room 202
Telephone: EMpire 5-2600, Extension 394
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Special in-service training courses arranged by the Training Officer
Length of Courses: Fifteen weeks
Open to military personnel and civilian employees of the David Taylor Model Basin and to other government employees, by permission of the Commanding Officer of the installation

Military Sea Transportation Service, Washington 25, D. C.

Training Officers: Maurice V. Foreman, Director, Training Division; John W. Meadows, Assistant Director
Building: T-8, Room 1217, 3800 Newark Street NW.
Telephone: OXford 6-9620
Afterhours Training Program: Jack W. Charles, Coordinator for the University
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Graduate and Special Courses in Management
Length of Courses: Fifteen weeks
Open to civilian and military personnel of the Military Sea Transportation Service and to other government employees, by permission of the Commanding Officer of the installation

National Naval Medical Center, Bethesda, Maryland

Information and Education Officer: Lt. Jane Zilin, USN
Building: 144, Information and Education Office
Telephone: 497-4585
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy, employees of the National Institutes of Health, and to other government employees, by permission of the Commanding Officer of the National Naval Medical Center

Naval Engineering Experiment Station, Annapolis, Maryland

Training Officer: Lorick F. Fox
Building: 3-A, Administration Building, Industrial Relations Department
Telephone: COlonial 3-2611, Extension 1210
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Courses in undergraduate program leading to the degrees of Associate in Arts, Associate in Science, and Bachelor of Arts; pre-engineering courses and graduate courses
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy and to other government employees and civilians, by permission of the Commanding Officer of the Engineering Experiment Station

Naval Hydrographic Office, Suitland, Maryland

Employee Development Officer: Paul F. Murphy
Building: FOB 3, Room G-121
Telephone: REdwood 6-2700, Extension 248
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts, Bachelor of Arts, and the Bachelor of Science in Cartography
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy, employees of the Census Bureau, and to other government employees in the Department of Defense, by permission of the Naval Hydrographic Office

Naval Propellant Plant, Indian Head, Maryland

Training Officer: Lester S. Hottle, Director of Education and Community Relations
Building: D-325, Industrial Relations Office
Telephone: Riverside 3-2111, Extension 591
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate and graduate courses
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy and to other government employees and civilians, by permission of the Commanding Officer of Naval Propellant Plant

Naval Research Laboratory, Washington 25, D. C.

Training Officers: William J. McLaughlin, Mary Nethken, Staff Training Section; E. C. Reinhardt, Science Education Section
Building: 43, Rooms 102 and 113, 4555 Overlook Avenue SW.
Telephone: 5741-856 or 5741-858
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate and graduate courses
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy at the Naval Research Lab-

oratory and other government employees, by permission of the Naval Research Laboratory

Naval Supply Center, Norfolk, Virginia

Training Officers: Harold V. Pelton, Director; Bernard A. La Barge, Assistant Director of Training
Building: W-143
Telephone: MAdison 2-8211, Extension 2144
Coordinator for the University: Andrew P. Rennie
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Arts in the fields of Controllership, Governmental Administration, and Personnel Management
Length of Course: Fifteen weeks
Open to military and civilian personnel of the Navy and to other government employees, by permission of the Commanding Officer

Naval War College, Newport, Rhode Island

Project Officer: LCDR Jack E. Evans, USN
Building: Luce Hall, Room 114
Telephone: VIking 1-3021
Coordinator for the University at Newport: Hiram M. Stout, Director, Naval War College Center
Building: Pringle Hall, Room 361
Telephone: VIking 7-2629
Liaison Officer for the University: R. C. Burns, Director of Institutes, Conferences, and Special Programs, College of General Studies
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Arts in International Affairs
Length of Courses: Fifteen weeks
Open to faculty and military and civilian members of the student detachment of the Naval Warfare Course and the Command and Staff Course of the Naval War College

Naval Weapons Laboratory, Dahlgren, Virginia

Training Officer: Mac A. Curtis, Head, Employment Division
Building: Industrial Relations Building
Telephone: NOrth 32511, Extension 609
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate and graduate courses in Physics
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Department of Defense and others, by permission of the Commanding Officer of the installation

U. S. Marine Corps Schools, Quantico, Virginia

Education Officer: Lt. John F. Imber, USMC
Building: Special Services Building, Education Office, Little Hall
Telephone: Quantico 1000, Extension 26749

Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Eight and fifteen weeks
Open to military personnel and their dependents and civilian personnel attached to the Marine Corps Schools

U. S. Naval Academy, Annapolis, Maryland

Coordinator for the Academy: William W. Jeffries, Senior Professor of English, History, and Government Department
Building: Maury Hall
Telephone: 268-7711, Extension 642
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Arts in Personnel Administration and undergraduate courses
Length of Courses: Eight and fifteen weeks
Open to military and civilian personnel attached to the Academy and other personnel by permission of the Naval Academy

U. S. Naval School of Hospital Administration, Bethesda 14, Maryland

Academic Director: LCDR Marvin J. Brown, MSC, USN
Building: 141, Room 131
Telephone: 497-4207
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: fifteen weeks
Open to military personnel assigned to duty under instruction at the U. S. Naval School of Hospital Administration

U. S. Naval Station, Washington 25, D. C.

Training Officer: Jacob O. Strine, Supervisory Training Officer
Building: 172, Second Floor, M at 8th Street SE.
Telephone: LIncoln 75700, Extension 2160, 2188, or 2416
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate courses in accounting, administration, and personnel management; special certificate program for supervisors to meet local in-service training needs
Length of Courses: Fifteen weeks
Open to military and civilian personnel of the Navy and to other government employees, by permission of the Superintendent of the Naval Weapons Plant

Joint Service Schools

Industrial College of the Armed Forces, Fort McNair, Washington 25, D. C.

Project Officer: Col. Tom W. Sills, USA

Building: Industrial College of the Armed Forces, Room D277
Telephone: OXford 5-3322
Coordinator for the University: R. C. Burns
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Business Administration
Length of Courses: Fifteen weeks
Open to students and faculty of the Industrial College of the Armed Forces

National War College, Fort McNair, Washington 25, D. C.
Project Officer: Lt. Col. B. Frank Fuller, Jr., USAF
Building: National War College, Room 117
Telephone: OXford 5-3403
Coordinator for the University: R. C. Burns
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Graduate program leading to the degree of Master of Arts in International Affairs
Length of Courses: Fifteen weeks
Open to students and faculty of the National War College

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
SOCIAL SECURITY ADMINISTRATION
(Bureau of Old Age and Survivors Insurance)
Baltimore 35, Maryland
Employee Development Officer: William B. Wiley, Chief, Educational Facilities Section
Building: Headquarters, Room 147
Telephone: 944-3000, Extension 2430 or 2429
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 441
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to employees of the Social Security Administration and to personnel of other governmental agencies by permission

DEPARTMENT OF JUSTICE, WASHINGTON 25, D. C.
(Member of Federal Triangle Educational Association)
Training Officer: Daniel Keenan, Departmental Training Officer
Building: Justice Department Building, Room 1226, 10th Street and Pennsylvania Avenue NW.
Telephone: REpublic 7-8200, Extension 3124
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Justice and to personnel of other government agencies by permission

FEDERAL BUREAU OF INVESTIGATION, WASHINGTON 25, D. C.

Special Agent: William E. Clark, Personnel Office
Building: Justice Department Building, Room 4513, 9th Street and Pennsylvania Avenue NW.
Telephone: EXecutive 3-7100, Extension 402
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Fifteen weeks
Open to employees of the Federal Bureau of Investigation only

DEPARTMENT OF LABOR, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: James C. Stevens, Employee Development Officer; Kenneth Bute, Assistant Training Officer
Building: Labor Department Building, Room 6220, 14th Street and Constitution Avenue NW.
Telephone: EXecutive 3-2420, Extensions 2101 and 2102
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of Labor and to personnel of other government agencies by permission

DEPARTMENT OF STATE, WASHINGTON 25, D. C.

Training Officer: Donald C. Leidel, Acting Chief, Career Development and Counseling Division, Office of Personnel
Building: State Department Building, 23d Street between Virginia Avenue and C Street NW.
Telephone: DUdley 3-2037
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Special courses designed for employees self-development
Length of Courses: Fifteen weeks
Open to employees of the Department of State, I. C. A., and U. S. I. A.

DEPARTMENT OF THE TREASURY, WASHINGTON 25, D. C.

BUREAU OF ACCOUNTS

(Member of Federal Triangle Educational Association)

Training Officers: Miss Joyce Davenport and Ken Eriksson, Employment Development Officers

Building: Treasury Annex Number 1, Room 240, Pennsylvania Avenue and Madison Place NW.
Telephone: WOrth 4-5367
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF CUSTOMS, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: James J. Doherty, Head, Employee Development Unit, James A. Everett, Employee Development Officers
Building: 2100 K Street NW.
Telephone: WOrth 4-2548
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF ENGRAVING AND PRINTING, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Mrs. Frances N. Nadeau, Employee Development Officer
Building: Industrial Relations Office, 14th and C Streets NW.
Telephone: WOrth 4-7571
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF NARCOTICS, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Walter Panich, Administrative Officer
Building: Coast Guard Building, Room 8000B, 1300 E Street NW.
Telephone: WOrth 4-2243
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

COAST GUARD, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Jasper L. Kranke, Supervisory Training Officer; Mrs. Eva Fletcher, Training Instructor

Building: U. S. Coast Guard Building, Room 4211, 1300 E Street NW.

Telephone: WOrth 4-5350

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Coast Guard and to personnel of other government agencies by permission

INTERNAL REVENUE SERVICE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: D. C. Barry, Chief, National Office Training Branch; Miss Ethel W. Morgan, Miss Ruby Bennett, Employee Development Training Officers

Building: Internal Revenue Service Building, Room 1113, 12th Street and Constitution Avenue NW.

Telephone: WOrth 4-3931 (Mr. Barry and Miss Bennett), WOrth 4-3377 (Miss Morgan)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

DISTRICT OF COLUMBIA GOVERNMENT, WASHINGTON, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Benjamin Ludwig, Training Officer; C. Howard Larson, Employee Development Assistant

Building: District of Columbia Government Building, Room 209, 499 Pennsylvania Avenue NW.

Telephone: NAtional 8-6000, Extension 2270

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the District of Columbia Government and to personnel of other federal government agencies by permission

DEPARTMENT OF PUBLIC WELFARE

Children's Center, Laurel, Maryland

Training Officer: Edward H. Rupp, Employee Development Officer
Building: Administration Building
Telephone: NAtional 8-1496
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Special courses in Psychology
Length of courses: Fifteen weeks
Open to personnel of the Children's Center and to personnel of other District and federal government agencies by permission

District of Columbia General Hospital

Employee Management Relations Specialist: Miss Elizabeth M. McQuaide
Building: Administration Annex, District of Columbia General Hospital, 19th and E Streets SE.
Telephone: LIncoln 7-9200, Extension 569
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate courses in Psychology
Length of Course: Fifteen weeks
Open to all employees of District of Columbia General Hospital

FEDERAL AVIATION AGENCY, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: E. A. Woody, Chief, Management Training Branch; Victor J. Onachilla, Chief, Executive Development
Building: T-3, Room 1118 (Mr. Woody); Room 1120 (Mr. Onachilla), 16th Street and Constitution Avenue NW.
Telephone: WOrth 7-2027 (Mr. Woody); WOrth 7-2340 (Mr. Onachilla)
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Federal Aviation Agency and to personnel of other government agencies by permission

FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Mrs. Pauline M. Foster, Assistant Personnel Officer

Building: New Post Office Building, Room 1207, 12th Street and Pennsylvania Avenue NW.
Telephone: EXecutive 3-3620, Extension 134
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Federal Communications Commission and to personnel of other government agencies by permission

FEDERAL RESERVE BOARD, WASHINGTON 25, D. C.

Training Officer: June A. Stetter, Administrative Assistant, Division of Personnel Administration
Building: Federal Reserve Building, 20th Street and Constitution Avenue NW.
Telephone: REpublic 7-1100, Extension 435
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to all government employees and others by permission

INTERSTATE COMMERCE COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Dyrck van Duyl, Training Officer
Building: Interstate Commerce Building, Room 1148, 12th Street and Constitution Avenue NW.
Telephone: NAtional 8-7460, Extension 7116
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to employees of the Interstate Commerce Commission

NATIONAL SCIENCE FOUNDATION, WASHINGTON 25, D. C.

Training Officer: E. Paul Broglio
Building: National Science Foundation Building, 19th Street and Constitution Avenue NW.
Telephone: STerling 3-2140, Extension 389
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Courses leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Fifteen weeks

Open to all government employees by permission of the National Science Foundation

POST OFFICE DEPARTMENT, WASHINGTON 25, D. C.
(Member of Federal Triangle Educational Association)

Training Officers: F. L. Royer, Mrs. Jeanne Hoag, Employee Development Officers
Building: New Post Office Building, Room 3140, 12th Street and Pennsylvania Avenue NW.
Telephone: WOrth 1-7293
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Post Office Department and to personnel of other government agencies by permission

VETERANS ADMINISTRATION, WASHINGTON 25, D. C.

Training Officer: Ignatus L. Billy, Chief, Employee Relations and Training Division
Building: Veterans Administration, Main Building, Room 115, Vermont Avenue and H Street NW.
Telephone: DUdley 9-3101
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to employees of the Veterans Administration and to personnel of other government agencies by permission

MELPAR, INCORPORATED
FALLS CHURCH, VIRGINIA

Training Coordinator: William F. Fenton
Building: Central Office Building, Personnel Office, 3000 Arlington Boulevard, Falls Church, Virginia
Telephone: JEfferson 4-6000, Extension 2350
Coordinator for the University: John G. Boswell
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate and graduate courses in mathematics
Length of Courses: Fifteen weeks
Open to Melpar employees only

NATIONAL 4-H CLUB FOUNDATION
WASHINGTON 15, D. C.

Director of Program: Glen C. Dildine, Consultant, Human Development-Human Relations Program
National 4-H Center: 7100 Connecticut Avenue NW.
Telephone: OLiver 6-9000

Coordinator for the University: Donald T. McNelis

Telephone: FEderal 8-0250, Extension 441

The College of General Studies, in cooperation with the School of Education, sponsors a workshop in Human Development and Human Relations at the National 4-H Club Center.

The workshops are held during the last week of June and all of July. They are conducted by the National 4-H Club Foundation in behalf of the Cooperative Extension Service. Six semester hours of graduate credit may be earned by participation in the workshop.

Complete information is available from State Extension Training Officers, the 4-H Club Foundation, and the Federal Extension Service.

EDUCATION COURSES FOR TEACHERS

Undergraduate and graduate courses for elementary and secondary school teachers have been given by the College of General Studies in coordination with the School of Education in the school systems in the areas listed below. Teachers interested in having a program in Education started in their communities should make their requests known through their Directors of Instruction to Andrew P. Rennie (FEderal 8-0250, Extension 441), Coordinator for The George Washington University of Off-Campus courses in Education.

Alexandria Public Schools

T. C. Williams, Superintendent
418 South Washington Street
Alexandria, Virginia
Telephone: KIng 9-9100

Arlington County Public Schools

Joseph B. Johnson, Assistant Superintendent for Instruction
1426 N. Quincy Street
Arlington, Virginia
Telephone: JAckson 2-7700

Berkeley County Public Schools

Jack K. Randolph, Superintendent of Schools
David E. Mudge, Assistant Superintendent
Berkeley County Public Schools
Martinsburg, West Virginia
Telephone: Martinsburg 8978

Calvert County Public Schools

Maurice A. Dunkle, Superintendent of Schools
Prince Frederick, Maryland
Telephone: Prince Frederick 76 and 80

Fairfax County Public Schools

W. Harold Ford, Assistant Superintendent for Instruction
Fairfax County School Board
Fairfax, Virginia
Telephone: CRescent 3-6500

Frederick County Public Schools

Quentin L. Earhart, Assistant Superintendent for Instruction
115 East Church Street
Frederick, Maryland
Telephone: MOnument 2-4191

Clarke County Public Schools

George W. Burton, Superintendent
Clarke County Public Schools
Berryville, Virginia

Telephone: Berryville 33

Jefferson County Public Schools

T. A. Lowery, Superintendent
Miss Lucille Heflebower, Supervisor of Instruction
Jefferson County Public Schools
Charles Town, West Virginia

Telephone: Charles Town 61

Loudoun County Public Schools

Caleb J. Gibson, Director of Instruction
Mrs. Ruth D. Schulke, Supervisor, Elementary Education
Loudoun County School Board
Leesburg, Virginia

Telephone: SPring 7-2570

Montgomery County Public Schools

Mrs. Helen M. Johnson, Supervisor of In-service Education
Lawrence G. Strickland, Teacher Specialist
Montgomery County School Board, Box 231
Rockville, Maryland

Telephone: POplar 2-5000

Prince Georges County Public Schools

Edward S. Beach, Jr., Administrative Assistant to the Superintendent
Prince Georges County School Board
Upper Marlboro, Maryland

Telephone: MArket 7-2811

Prince William County Public Schools

Claude E. DeHaven, Assistant Superintendent for Instruction
Prince William County School Board
Manassas, Virginia

Telephone: EMpire 8-2104

St. Mary's County Public Schools

Robert S. King, Jr., Superintendent of Schools
Roy Pepper, Supervisor of Instruction
St. Mary's County School Board
Washington Street
Leonardtown, Maryland

Telephone: GReenwood 5-9141

Worcester County Public Schools

Paul S. Hyde, Assistant Superintendent for Instruction
Ernest G. Holland, Assistant Supervisor of Pupil Personnel
Worcester County School Board
Market Street
Snow Hill, Maryland

Telephone: Snow Hill 582 and 583

CAMPUS DIVISION

Degree Program

The Campus Division is designed for promising adults with unusual backgrounds who merit the individual consideration of this Division's experimental approach to admission, advanced standing, curricula, and evaluation of achievement. The criteria for eligibility for admission are stringent in order to limit matriculation to (1) adults well qualified to undertake college work but lacking certain academic requirements for admission to other degree-granting schools and colleges of the University and (2) adults who through work experience, have gained broad knowledge and high competency in some area of learning. This knowledge may be validated by special examination to entitle them to advanced standing toward a degree.

Requirements for Admission

The applicant must meet the following requirements:

1. He must be an adult who has already achieved outstanding success in his vocation.

2. He must have completed 12 semester hours of work at this University while enrolled in courses in the Off-Campus Division, the Division of University Students, or the Division of Special Students, with a grade of at least *C+* (quality-point index of 2.50). The student who has completed a substantial amount of college work elsewhere with excellent grades may apply for admission to degree candidacy after 6 semester hours at this University.

3. He must present valid reasons for selecting degree candidacy in the Campus Division of the College of General Studies rather than in another school or college of the University.

4. He must enroll for at least two courses a semester on Campus. Full-time study is encouraged.

The Campus Division offers programs leading to the degrees of Associate in Arts and Bachelor of Arts, as described under the Off-Campus Division, pages 31–33 and 35–37.

In cooperation with Columbian College of Arts and Sciences; the School of Education; and the School of Government, Business, and International Affairs, the Campus Division makes available programs leading to the degree of Bachelor of Arts with majors in the liberal arts and sciences, education, and government. Requirements for these programs are stated in the separate catalogues of the schools concerned. Students selecting these majors must satisfy the prerequisite course requirements prior to admission to candidacy or as additional work after being admitted.

The program of each student admitted to this Division is carefully planned in consultation with a faculty adviser, who takes into account the student's maturity, background, work experience, and needs.

Armed Forces Section

The Armed Forces Section of the Campus Division was established for those service personnel who wish to study full-time at the University and who have only a limited time under military orders in which to complete their programs of study. Such students register for campus courses through the College of General Studies

and remain under its administrative and academic control. By permission of the Dean they may enroll in appropriate courses in the Off-Campus Division.

Military and Naval personnel are eligible for admission to this section of the Campus Division if they meet the following requirements:

1. The applicant must be in attendance under official orders which give him a specified time in which to finish his degree requirements.
2. He must prove that the degree requirements can be completed in the time specified in his orders only by taking advantage of the advanced standing provisions of this College.
3. He must be in a position to enroll for full-time study.

By special arrangements with the Department of the Navy, a special naval section of the Armed Forces Section has been established. All naval personnel attend the University as full-time students, ordinarily for five semesters. Campus coordinator and academic adviser: Dr. John Francis Latimer, Building E, Room 300: FEderal 8-0250, Extension 494.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields through the educational facilities of the School of Government, Business, and International Affairs for a selected group of Air Force officers. Those officers who qualify, by a combination of academic background and the satisfactory completion of this program can be awarded a Bachelor's degree by the College of General Studies. Officers who already hold Bachelor's degrees may take these courses for graduate credit toward Master's degrees. Campus coordinator and academic adviser: Dr. Waldo Sommers, Hall of Government, Room 205 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 404 or 588.

For administrative counseling, consult Donald T. McNelis, Director, Campus Division, the College of General Studies, 706 Twentieth Street NW.; Telephone: FEderal 8-0250, Extension 441 or 487.

Regulations

Students in the Campus Division of the College of General Studies are subject to and are expected to familiarize themselves with the regulations of the University stated in the general catalogue, as modified in this Bulletin. Copies of the general catalogue are available at the Office of the Director of Admissions.

Professional In-service Training

Special programs are offered to meet the in-service needs of special groups and others will be developed as the need arises.

DIVISION OF COMMUNITY SERVICES

This Division consists of a program of popular credit and noncredit courses, institutes, and lectures offered both on campus and off campus.

The Division was organized to provide needed auxiliary educational services and to promote programs designed to supplement the formal educational offerings of the University.

Noncredit courses in a wide variety of subject fields may be set up at the request

of any interested group. There are no entrance requirements. The length of each course is determined by the wishes of the sponsoring group and the nature of the subject to be studied.

Civic clubs, church groups, trade associations, parent-teacher associations, and other organizations which are interested in promoting and organizing informal programs of study, setting up conferences, securing assistance in organizing and in developing their own leadership training courses or institutes, or receiving specialized advice or assistance are invited to consult Mrs. Lillian Fox Quigley, Director of the Division of Community Services of the College of General Studies. Call FEderal 8-0250, Extension 441.

Among the courses offered by the Division of Community Services, are the following. Unless otherwise specified, all courses are noncredit.

Administrative Development

The techniques of management and instruction. Part of the Administrative Development Program of the Office of the Adjutant General, Department of the Army.

Agency for International Development

The College Preparatory Workshop for Foreign Students, a series of class meetings led by experienced university teachers, introduces the foreign student to the system of higher education in the United States. Students are instructed and given practice in classroom procedures, examination techniques, note taking, report writing, the use of the library, and outside study.

American Speech and Diction

Designed for employees of foreign embassies. Articulation drills, stress and intonation patterns in "standard" American English, discussion of dialect differences, and vocabulary-building exercises. Individually designed exercises and daily tape recordings.

Business Management Institute

An institute on modern management principles and techniques for small business executives. Offered in cooperation with the Small Business Administration to improve skill and ability in solving practical business problems.

Effective Speech Communication

Principles of effective speech communication, including practice in the organization, delivery, and evaluation of presentations commonly encountered in management situations.

Growth of Political Parties in the United States

Chronological treatment of the growth of American political parties. Factors in our political history relevant to the current party struggle and the future course of politics: role of party conventions; importance of party platforms; influence of particular personalities; continuance of certain issues; impact of wars and other disasters; mechanisms for achieving party victory; and, with special attention, the relationship between minor parties and splinter groups and the fundamental two-party nature of our political system. Parties considered socially, ethically, and politically.

Hospital Administration

A credit course of lectures and discussions broadly covering the field of hospital administration designed especially for those working in hospitals at the executive and department-head level and for those employed in federal hospital programs who deal with various phases of hospital programming and operations.

Topics include the history of hospitals, the scope and organization of voluntary and federal hospital programs, the functional elements of hospitals, with emphasis on the application of modern management tools in Hospital Administration.

Institute for Parents

Emphasizes *understanding* in four areas of study: the gifted child, reading problems, modern school methods, and the early adolescent. Primarily to help parents understand their children in relation to themselves as parents, to the school, and to the community.

International Cookery

Lectures and demonstrations on basic dishes of various countries to illustrate different methods of cooking and characteristic seasonings. Tastiness, low cost, high nutritional value, and availability of ingredients are considered in the choice of recipes.

Investment Management

A course in management for those with a basic knowledge of the stock market and investment principles. Topics include the selection of stocks most suitable for specific objectives.

Investments

"How to Invest from $50 to $50,000" is frequently offered in answer to popular demand. Topics include insurance, wills, bank deposits, government bonds, real estate, various types of securities, the New York Stock Exchange, mutual funds, investment advisory services, and the importance of fitting the financial plan to the individual.

Management Communication

Elements of the communication process; problems in communication; basic principles of effective communication, psychological and sociological aspects of communication; and problems of specific communication efforts.

Management for Research, Development, and Testing Laboratories

Designed to train executives in development of overall managerial skills. Planned to give executives a general familiarity with tasks, problems, techniques, and methods of management; to relate these general principles to functioning of their specialized business activities; and to provide them with a forum for discussing common problems and interchanging views, knowledge, and experience.

Manuscript Clinic: Books for Children

A practical service for writers who are in need of professional literary counsel and detailed constructive criticism by an experienced author, editor, or critic. Completed work or work in progress is accepted in any one of the following categories: (1) a work of fiction, not to exceed 30,000 words; (2) two or three short

stories; (3) a biography; (4) a work of nonfiction, not to exceed 20,000 words, or several articles; (5) a translation, not to exceed 10,000 words; (6) a picture-story book, including illustrations; (7) an outline for a longer work, together with several sample chapters.

Writers are instructed in the preparation of manuscripts for submission to a publisher, and advice on marketing is available. After consulting with the coordinator, the consultee meets with an appropriate consultant. Arrangements are made for three subsequent private meetings at a time and place convenient to the persons concerned.

Nursing Education

A credit course in the management of the hospital nursing unit is offered for nurses in the metropolitan Washington area. Emphasis is placed on the relation of the hospital nursing unit to the hospital and community, current concepts and standards in nursing service and their application to unit management, and the development of techniques for the implementation of concepts and policies. Other credit courses in this field are being developed.

Planning for Retirement

A ten-session course used by many large business and industrial firms to help men and women plan for retirement.

Preparation of Summaries

Training in accurate summarizing of classified documents and information in readable form.

Professional Writing (Introductory)

The essentials of writing techniques. Manuscripts submitted for consideration and criticism of the teacher and class. Analysis of magazine writing opportunities for free-lance writers.

Professional Writing (Advanced)

Emphasis on improving quality and techniques to a professional, salable level. An interval of two weeks between classes gives the student a greater opportunity for manuscript preparation. Major emphasis is upon article writing.

Program Planning for Organizations

Designed especially for civic and club workers. Topics include: planning individual programs, public relations, the responsibility of leadership, and exploring projects and activities for a particular group.

Retarded Child

Brief historical overview of social concern for the retarded child. Problems of definition and classification; the matter of institutionalization; hopefulness of research. The course is especially designed to build up a broad understanding from the point of view of the parents.

Stenographic Refresher

Dictation directed toward a review of brief forms, word beginnings, word endings, the 3,000 most frequently used words in the English language, with 80 to 100 word dictation.

Studies in Management

Studies of modern concepts of the management function and the background of modern management theory, the tools of management, human factors in management, direction of programs, and formulation of policies.

Typing Refresher

Diagnostic and remedial practice on electric or manual typewriters.

Written Communication

A review of the principles of clear and effective writing, particularly as it is a concern of governmental correspondence. Ten sessions, classroom demonstration and discussion of textbook assignments; ten sessions, testing and individual conferences.

Writing for Children

A noncredit elementary workshop course is offered for beginning writers during the fall semester. An advanced workshop is offered in the spring semester.

Writers Institute

This six-day conference on fact and fiction for children and youth is a series of roundtable discussions on topics of broad general interest, conducted by experienced authors and editors.

ADMISSION AND REGISTRATION

A simplified system of admission and registration is used in noncredit courses. Such courses are open to any individual interested in enrolling. When a noncredit course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. Classes may be limited in size in order to maintain the standards desired.

FEES

The tuition fees for noncredit courses are determined by the length and nature of the course.

READING CLINIC

The Reading Clinic, Binney Hall, 2018 I Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition, special reading improvement classes are conducted on the high school and adult levels.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted, and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachisto-

scope, rate accelerator, and controlled reader are used for increasing speed of comprehension.

Fees

Individual Diagnosis	$35.00
Individual Reading Instruction	5.00 a lesson
Semi-individual Instruction	4.00 a lesson
Small Groups with common reading difficulties	3.25 a lesson

All fees for diagnostic and corrective work are payable in advance at the Office of the Cashier. Reading Improvement Course fees are payable in full at the time of registration. For further information, consult Miss Mary E. Coleman, Director, or Miss Joanne B. Parker, Assistant Director, Binney Hall, 2018 Eye Street NW.: FEderal 8-0250, Extension 491 or 598.

INSTITUTES, CONFERENCES, AND SPECIAL PROGRAMS

A Program in American Studies was inaugurated in the spring of 1962 with a series of conference-seminars for students and leaders from other countries visiting the United States under Department of State grants. Principal objective of the series is to present an over-all view of our country today, synthesizing its history, politics, economy, and culture through informal discussions led by outstanding authorities in the various fields.

In addition to the Program in American Studies, professional conferences and workshops have been organized.

Arrangements have been made with Airlie Foundation to use its facilities near Warrenton, Virginia, as a conference center.

For further information consult R. C. Burns, Director of Institutes, Conferences, and Special Programs, College of General Studies, Building F, 706 Twentieth Street NW.: FEderal 8-0250, Extension 441.

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the Off-Campus Division of the College of General Studies or Campus courses required in degree programs. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

Courses of instruction are scheduled by Training Directors of the various groups, organizations, agencies, and installations interested in conducting an Off-Campus program of college courses. These classes are generally offered in the late afternoon or evening, are identical with the daytime and evening sections of corresponding courses on campus, are taught by many of the same instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the customary four years, a student who is able to give only part of his time to college work may complete a regular curriculum and obtain a degree.

EXPLANATION OF COURSE NUMBERS

Courses are assigned dual numbers. The first is a serial number assigned by the College of General Studies at the time of registration. The serial number does not appear in this catalogue. The second number is a departmental course number assigned by the department concerned. The serial numbers are used to distinguish one class from another when the same course is offered simultaneously at different places. The departmental numbers indicate the academic level of each course.

The following system of numbering is used:

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the officer of instruction, to qualified seniors only.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3–3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING

Chairman: Ralph Dale Kennedy, Ph.D., Professor of Accounting, Hall of Government, Room 103 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 243

1–2 *Introductory Accounting* (3–3)
First half: basic principles underlying accounting records, preparation of the work sheet and financial statements, accounting for single proprietorships and partnerships. *Second half:* accounting for corporations and introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 *General Accounting* (3)
Study of accounting systems and accounting for single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

101 *Cost Accounting* (3)
Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; analysis and interpretation of cost data. Prerequisite: Accounting 1–2.

111 *Financial Statement Analysis* (3)
Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1–2 or permission of the instructor.

115 *Survey of Accounting* (3)
Accounting for single proprietorships and corporations with emphasis on the use of accounting information in the management process; study of theory, terminology, and the analysis and interpretation of accounting data. Not open for credit to Accounting or Business Administration majors.

121–22 *Intermediate Accounting* (3–3)
First half: valuation and amortization problems of current assets, long-term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

144 *Federal Accounting* (3)
Accounting procedures in the Federal Government, with emphasis on agency level accounts, implementation of accrued expenditure legislation, and accounting support for cost-based budgets. Accounts of the United States Treasury; current concepts of allotment, obligation, and disbursement accounting and reporting. Prerequisite: Accounting 141 or permission of the instructor.

161 *Income Tax Accounting* (3)
Problems involved in the federal income taxation of individuals and corporations, differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1–2.

171 *Auditing* (3)
Duties and responsibilities of auditors: principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121–22.

181 *Accounting Systems* (3)
Theory and procedure of designing and installing accounting systems for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121–22, and 171, or permission of the instructor.

191 *Advanced Accounting* (3)
Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121–22.

193 *Business Budgeting* (3)
Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1–2.

211–12 *Managerial Accounting* (3–3)
First half: analysis of the accounting system with special reference to the use of financial and operating records and accounting reports as tools of management; a study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1–2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite to Accounting 212: Accounting 211 or permission of the instructor.

293 *Budget Preparation and Administration* (3)
Principles of and research on the formulation, adoption, and execution of a system of budgetary control to aid in the management of commercial or industrial businesses.

ART

Chairman: Donald Chenoweth Kline, B.Arch., M.F.A., Professor of Art, Building X (2107 H Street NW.), FEderal 8-0250, Extension 351

3 *The Story of Painting in the Western World* (3)
A Historical survey of western art from prehistoric to modern times. Special emphasis on the masters of the Renaissance, 17th century baroque art, 18th century art—including American artists and the 19th and 20th century modernists. (A telecourse offered Summer 1961.)

BOTANY

Chairman: Russell Bradford Stevens, Ph.D., Professor of Botany, Building C, Room 401 (2029 G Street NW.), FEderal 8-0250, Extension 459

BIOLOGY*

1–2 *Introductory Biology** (4–4)
This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2. Material fee, $10 a semester.

BUSINESS AND PUBLIC ADMINISTRATION

Chairman: James Carlton Dockeray, Ph.D., Professor of Finance, Building Y, Room 12 (802 Twenty-first Street NW.), FEderal 8-0250, Extensions 512, 539

BUSINESS AND PUBLIC ADMINISTRATION

201 *Advanced Administrative Management* (3)
(Replaces Business Administration 201 and Public Administration 210)
An advanced course in administration emphasizing principles and practices common to administrative units of all kinds.

204 *Quantitative Factors in Administration* (3)
Developments in quantitative methods of administration.

* Beginning with the academic year 1962–63, Biology 1–2 *Introductory Biology* (4–4) replaces Botany 1–2 *General Botany* (3–3) and Zoology 1–2 *Introduction to Zoology* (4–4).

205 *Seminar in Communication and Executive Action* (3)
(Formerly Public Administration 242)
Seminar in the communications processes. Research and analysis, identification of factors relating to receptivity; the dynamics of communication.

206 *Personnel Management* (3)
(Formerly Public Administration 231)
Basic principles; structure and organization of personnel offices; responsibilities; interagency relationships; personnel staffing, training, and work measurement.

207 *Human Relations in Administration* (3)
(Replaces Business Administration 275–76, and Public Administration 241)
Individual, group, intergroup, and other human behavior and development; application of social science research to administration. Practical applications will be emphasized.

262 *Contemporary Administrative Theory and Practice* (3)
(Formerly Public Administration 262)
Current theories and trends in management with particular attention to the behavioral sciences communications and applicability of research.

268 *Management Engineering* (3)
(Formerly Business Administration 268)
Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys including the study of work measurements, work simplification management audits, and other management improvement programs.

280–81–82 *Managerial Aspects of National Security*[a] (3–3–3)
The application of business management principles to the military aspects of national security; organization and administration of the Federal Government for national defense; management of national resources (natural, human, energy, economic); budgeting and controllership; determination of requirements; procurement; production; supply management; and communications.

287 *Relation of Government to Business* (3)
(Formerly Business Administration 287)
Activities of government in their relation to business management in such areas as labor relations, wages, production, and prices.

295 *Research Methods* (3)
Research techniques, sources of information, array and analysis of data, interpretation and presentation of the findings.

BUSINESS ADMINISTRATION

101 *Introduction to Business* (3)
(Formerly Business Organization and Combination)
The business environment; its effects upon the decision making process.

102 *Fundamentals of Management* (3)
Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.

103 *Institutional Management* (3)
Philosophy of hospital administration: special services, food service, maintenance, internal review.

105 *Personnel Management* (3)
Industrial personnel and manpower programs, organizations and policy in personnel activities.

[a] Available only to students in the Master of Business Administration program at the Industrial College of the Armed Forces and the Air University.

106 *Problems in Personnel Management* (3)
Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.

107 *Labor-Management Contracts* (3)
Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.

109 *Office Management* (3)
Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.

111–12 *Personnel Records Administration* (3–3)
First half: basic principles, techniques, and methods used in collecting, processing, evaluating, and storing personnel records of all kinds. *Second half:* problems and cases in special kinds of records keeping and records administration.

113 *Real Estate* (3)
Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.

121 *Risk Management* (3)
A general course in underlying principles of property, life, marine, and casualty insurance, and the function of insurance in the economic life of a business or individual.

131 *Business Finance* (3)
Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1–2.

138 *Investments* (3)
Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1–2.

141 *Principles of Marketing* (3)
An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1–2.

150 *Procurement and Materials Management* (3)
Purchasing organization, procedures, and policies; market relationships; selection of merchandise and sources of supply; procurement information and records; evaluation of procurement practices in industry and government.

161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3)

162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3)

163 *Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts* (3)

198 *Management Communication* (3)
A survey course in the problems of communication; written communication: style and format; oral communication: oral briefing and presentation; group leadership; rapid reading; completed staff work; and related subjects.

198 *Case Problems in Management* (3)
Principles and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.

199–200 *Research* (3–3)

209 *Seminar in Personnel Management* (3)
Discussion of industrial personnel and manpower management, and research in advanced problems.

210 *The Personnel Manager* (3)
The job of the personnel manager and his place in the organization; relations of the personnel manager to other executives; the personnel manager's policy role, and his relations with the chief executive. Key problems of the senior personnel executive.

218 *Introduction to Data Processing* (3)
A survey of modern data processing systems with emphasis on the management problems associated with the installation and use of such systems.

219-20 *Data Processing: Mechanics and Applications* (3-3)
Characteristics of major computer systems; relation to their selection and application to administrative processes. Feasibility studies. Relationship of data processing and quantitative methods of management. Case studies. Prerequisite: Business Administration 218.

227 *Linear Programming* (3)
Introduction to the vocabulary and methodology of management science through the study of linear programming techniques. Case studies. Minimum mathematical tools are included.

237 *Investment Analysis* (3)
An advanced course in the applications of investment principles and analytical techniques to the selection of investments. Prerequisite: Business Administration 138.

251 *Seminar in Retail Management* (3)
Research in retailing practices, with emphasis on trends, new developments, and current problems.

261 *Seminar in Advanced Management* (3)
Principles of organization. Analysis of organization problems involving the relation of government bureaus and offices with military services, the Congress, the public, other government departments, and with industrial concerns. Review and analysis of business administration and management. Intensive training in conference techniques and the oral presentation of points of view.

263 *Business Organization and Management* (3)
Principles and techniques of administration and management. Analysis of methods of forecasting, planning, organizing, assembling personnel and resources. Historical development of management as a background for present day methods.

275 *Human Relations in Business* (3)

286 *Management in the Armed Forces* (3)
Special problems of military organization and management; applicability of business management techniques to the armed forces.

288 *Executive Leadership* (3)
Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and public administration; review of the literature, significant research findings, and practical illustrations.

291 *Seminar in Business Management* (3)
Research on various phases of management as practiced in American industry.

293-94 *Business Research* (3-3)

296 *Seminar in Controllership* (3)
Research on advanced problems of the controller in all types of business organization and the Federal Government.

297 *Case Studies in Business Administration* (3)
Problems of management are analyzed with the view of developing a practical solution; cases are used to show the problems of personnel in marketing, industrial management, finance, etc.

299-300 *Thesis* (3-3)

HOSPITAL ADMINISTRATION

221 ***Survey of Medical Care Organization*** (3)
A survey course for students in other fields who wish an overall knowledge of hospital, nursing home, and other organizations for medical care. (Not open to majors in Hospital Administration.)

222 ***Survey of Medical Care Management Procedures*** (3)
A survey course for students in other fields who wish an overall knowledge of management procedures in hospitals, nursing homes, and similar organizations. (Not open to majors in Hospital Administration.)

PUBLIC ADMINISTRATION

211 *Problems of Governmental Organization* (3)
Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships.

212 *Case Studies in Public Administration* (3)
Analysis and discussion of problems in public management, approached by the group using primarily the case method.

213 *Administration in Government* (3)
Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

221 *Staff Functions in Government* (3)
Designed primarily to provide an understanding of the nature, use, and problems of the staff functions as tools of management. Survey of such staff areas as personnel, budgeting, controllership, procurement, property management, the agency lawyer, security, public relations and information, planning, research, the secretariat, management engineering, auditing, accounting, and administrative services.

232 *Federal Personnel Procedures* (3)
Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.

233 *Seminar in Manpower Development and Utilization* (3)
Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.

237 *Intermediate Management and Supervision* (3)
The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.

251 *Governmental Budgeting* (3)
The role of budgeting in management; the principles and practices of budgetary formulation and administration.

252 *Seminar in Planning and Programming* (3)
Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.

260 *Seminar in Policy Formulation and Administration* (3)
Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.

261 *Public Opinion and the Administrator* (3)
Theories, techniques, and methods of working with the public; the use of interest groups in developing governmental programs; evaluating public relations programs; the importance of timing; use of public opinion measurement techniques.

272 *Seminar in Public Personnel Administration* (3)
The purpose of this course is to provide advanced students with directed reading in specific areas of public personnel administration.

299–300 *Thesis* (3–3)

CHEMISTRY

Chairman: Charles Rudolph Naeser, Ph.D., Professor of Chemistry, Samson Hall, Room 201 (2036 H Street NW.), FEderal 8-0250, Extension 261

3–4 *Fundamentals of Physical Science* (4–4)
A year course: credit is not given for the first half until the second half is completed. Introduction to methods and achievements of physical science; covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, $11 a semester.

11–12 *General Chemistry* (4–4)
A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). An elementary course in general chemistry. Prerequisite: one year of high school algebra. Laboratory fee, $18 a semester.

21 *Qualitative Inorganic Analysis* (4)
Lecture (2 hours), laboratory (6 hours). Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12, or a placement examination which may be waived at the discretion of the instructor. Laboratory fee, $18.

111–12 *Physical Chemistry Lectures* (3–3)
A year course: credit is not given for the first half until the second half is completed. Introduction to physical chemistry. Students registering for Chemistry 111–12 must register concurrently for Chemistry 113–14 unless they already have adequate credit for physical chemistry laboratory. Prerequisite: either (1) Chemistry 22 and 152, Mathematics 22 or 30, Physics 13 or 15, or (2) Chemistry 21, Mathematics 22 or 30, Physics 14.

113–14 *Physical Chemistry Laboratory* (2–2)
A year course: credit is not given for the first half until the second half is completed. Laboratory to accompany Chemistry 111–12. Students registering for Chemistry 113–14 must register concurrently for Chemistry 111–12 unless they already have credit for lectures in physical chemistry. Laboratory fee, $18 a semester.

ECONOMICS

Chairman: John William Skinner, Ph.D., Associate Professor of Economics, Hall of Government, Room 311 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 235

1–2 *Principles of Economics** (3–3)
Lecture (2 hours), recitation (1 hour). Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

121 *Money and Banking* (3)
Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.

133 *The Economy of the Soviet Union* (3)
Development and main features of the economic life of the Soviet Union.

* Economics 1–2 is prerequisite to all other courses in Economics.

141 *Unionism and Collective Bargaining* (3)
The development and characteristics of American unionism and collective bargaining as economic and social institutions, appraisal of economic and social aspects, public policies and controls.

142 *Labor Economics* (3)
Characteristics of the American labor force, operations of labor markets, wage theories and practices, impact of collective bargaining, causes and characteristics of unemployment, public policies and programs.

165 *Government Control of Economic Activity* (3)
Changing role of government in promoting and regulating economic activity, types and spheres of control.

217–18 *Survey of Economics* (3–3)
Survey of economic analysis and policy. Not open to graduate students in economics or economic policy.

219 *Managerial Economics* (3)
Analysis of price, production, and inventory policies of business firms.

241 *Unionism, Collective Bargaining, and Labor Economics* (3)
An accelerated introductory course in labor economics primarily for graduate students in Personnel Administration.

244 *Problems in Unionism, Collective Bargaining, and Labor Economics* (3)
Concentrated study of selected economic, social, and legal aspects of labor relations and labor economics.

246 *Foreign Labor Movements* (3)
Labor in the economic, social, and political structures of selected foreign countries. Contrasts and comparisons with the United States.

251 *Theories of Economic Development* (3)
Growth and change in economic activity, capital accumulation, innovations in technology and business organization.

267 *Economic Organization of the Communist Orbit* (3)
Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth.

EDUCATION

Chairman: Blake Smith Root, Ed.D., Professor of Education, Monroe Hall, Room 202 (2115 G Street NW.), FEderal 8-0250, Extension 672

108 *Human Development, Learning, and Teaching* (3)
(Formerly Education 109–10)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. For the general student as well as the prospective teacher. Principles of effective teaching based on an understanding of human development and the nature of learning. Prerequisite: Psychology 22 or 121.

112 *Educational Measurement* (3)
Scope, needs, services to students, selection and construction of teacher made tests, interpretation of tests for evidence purposes. Prerequisite: Education 108 and 123.

113 *Elementary School Art* (3)
Lecture and laboratory (3 hours), field work—as arranged. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, $4.50.

114 *Elementary School Music* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22.

115 *Teaching of Reading in the Elementary School* (3)
Lecture (2 hours), field work (2 hours)—as arranged. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 108 and 123 or teaching experience.

116 *Elementary School Social Studies* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

117 *Elementary School Science* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

118 *Teaching Science in the Elementary School* (3)
Designed to meet the needs of elementary teachers who wish to improve their science background and become more skillful in the method of teaching; content based on needs of group; nontechnical with respect to science content, practical in method aspect; simple experiments, observations, use of printed materials, field trips, observation of teaching; a how-to-do course for teachers who have little science knowledge and feel insecure in their science teaching. Prerequisite: Education 108 and 123 or teaching experience.

120 *Elementary School Arithmetic* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

123 *Society and the School* (3)
(Formerly Education 121–22)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. For the general student as well as the prospective teacher. Historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies; organization and operation of schools; functions of school personnel.

128 *Children's Literature* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.

138 *Teaching Social Studies* (2 to 4)
Lecture (2 hours), field work (2 hours)—as arranged. Prerequisite*: twenty-four semester hours of social studies.

146 *Teaching Foreign Languages* (2 to 4)
Prerequisite*: eighteen semester hours of one foreign language.

147 *Foreign Language Instruction in the Elementary School* (2)
Methods, materials, and activities essential in teaching foreign languages in the elementary school.

161 *Management of the Hospital Nursing Unit* (3)
Analysis of nursing today, the hospital, structure and changing functions, basic concepts of management, personnel practices and activities, interpersonal relationships, legal aspects and safety factors, economics—inventories, and evaluation procedures of the hospital nursing unit.

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* This is a special methods course. Prerequisite to all special methods courses: Education 108, 123, and 131, or adequate teaching experience. Additional prerequisites are stated under each course.

205–6 *The Curriculum* (3–3)
For experienced teachers. *First half:* curriculum foundations and issues; comparison of curriculum patterns. *Second half:* principles and procedures in curriculum development; group consideration of student problems.

207 *Curriculum Materials* (3)
For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

208 *A Workshop in Human Development* (6)
A workshop for agricultural extension staff members designed to apply the principles of the behavioral sciences to their work.

209 *Child Growth and Development* (3)
An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.

210 *Adolescent Growth and Development* (3)
A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.

211 *Evaluation in Education* (3)
Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

212 *Educational Measurement* (3)
Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.

213–14 *History of Education* (3–3)
First half: the European backgrounds of American education. *Second half:* the evolution of the American school system.

215 *Education of Exceptional Children* (3)
For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

216 *Education of Slow-learning Children* (3)
Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

217–18 *Philosophy of Education* (3–3)
First half: designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.

221 *Early Childhood Education* (3)
For experienced teachers. Emphasis on methods, materials, and learning experiences designed to meet the developmental needs of kindergarten and primary-grade children.

223–24 *Reading Problems* (3–3)
For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.

227 *Basic Issues in Elementary Education* (3)
A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.

228 *Instructional Areas in Elementary Education* (3)
Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.

229 *Administration of Elementary Education* (3)
For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.

231 *Secondary School Classroom Procedures** (3)
Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.

233 *Audio-visual Education** (3)
Lecture (2 hours), laboratory (1 hour). Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, $7.

241 *Education of the Gifted** (3)
For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.

243 *Human Relations in the Classroom** (3)
Principles and practices involved in interpersonal relationships between learner and teacher and among learners.

245 *School and Community** (3)
The school as an important member of a team of social agencies that builds the community.

251 *Guidance in Elementary and Secondary Schools** (3)
A survey course: scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.

252 *Organization and Administration of Guidance Services* (3)
Designed for guidance directors and supervisors and experienced school counselors who hope to qualify for such positions in the near future. Prerequisite: a minimum of 15 semester hours of approved graduate work in Measurement and Guidance

253 *Analysis of the Individual for Purposes of Counseling* (3)
(Formerly Psychology 236)
A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: Education 112 or the equivalent.

254 *The Junior High School** (3)
Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities.

257 *Occupational and Educational Information* (3)
(Formerly Psychology 229)
Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.

258 *Techniques of Counseling* (3)
(Formerly Psychology 228)
An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling prob-

* Prerequisite: adequate professional preparation.

lems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Education 253 and 257. In exceptional cases Education 253 or 257 may be taken concurrently with 258.

263–64 *Employee Training* (3–3)

First half: nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half:* administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265–66 *Teaching Secondary School English* (3–3)

A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half:* communication skills—structural linguistics, composition, and speech. *Second half:* American and English literature.

271 *The Teacher and School Administration** (3)

A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

272 *The Teacher and School Supervision** (3)

Nature, organization, human relationships, and techniques.

275 *School Finance** (3)

Educational financial theory, practice, and control, including methods of financing

276 *Seminar: Public Relations in School Administration** (3)

Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

278 *School Law** (3)

Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group

282 *Use of Community Resources* (3)

A course for teachers on all levels, with emphasis on learning to use community resources to strengthen their programs of learning and teaching. The Smithsonian Institution will receive special attention as one of the examples of a valuable community resource.

285 *Extra-classroom Activities** (3)

Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.

ENGLISH†

Chairman: Charles William Cole, Ph.D., Professor of American Literature, Monroe Hall, Room 404 (2115 G Street NW.), FEderal 8-0250, Extension 422; Building T, Room 12 (2110 G Street NW.), FEderal 8-0250, Extensions 360, 547

ENGLISH COMPOSITION

Basic English (0)

Instruction, drill, and exercises in grammar, vocabulary, spelling, and mechanics in general; instruction and exercises in composition and reading. This course is designed to prepare students for English 1. No academic credit. Tuition fee, $44.

* Prerequisite: adequate professional preparation.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may upon passing further tests, be exempted from one or both halves of the English Composition course. Those who are inadequately prepared for English 1 will be assigned to *Basic English*. In lieu of *Basic English*, Off-Campus students may, if they desire, be given permission to register for English 1X on campus. English 1 or 1X is prerequisite to all other courses in English.

1 *English Composition* (3)
Review of grammar, exercises in composition, readings.

2 *English Composition* (3)
Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X.

11 *The Writing of Reports* (3)
Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X and 2.

WORLD LITERATURE

41–42 *Introduction to World Literature* (3–3)
First half: a survey of Western literary heritage from Homer to Milton. *Second half:* a review of Western literature from the English metaphysical poets to Franklin Delano Roosevelt.

ENGLISH LITERATURE

51–52 *Introduction to English Literature* (3–3)
A historical survey. Prerequisite: English 1 or 1X.

135–36 *Shakespeare* (3–3)

AMERICAN LITERATURE

71–72 *Introduction to American Literature* (3–3)
A historical survey. *First half:* from the beginnings to the Civil War. *Second half:* from the Civil War to the present. Prerequisite: English 1 or 1X.

143 *The Development Narrative in Literature* (3)
A study of those works in world literature dealing with the development of the child

144 *American Literature Since 1920* (3)
Poetry, drama, and the novel. Readings and discussion.

GEOGRAPHY

Chairman: Robert Dale Campbell, Ph.D., Professor of Geography, Building I, Room 202 (2135 G Street NW.), FEderal 8-0250, Extensions 287 and 298

51 *Introduction to Geography* (3)
A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

52 *World Regions* (3)
The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.

113 *Geomorphology** (3)
Nature and evolution of earth forms, with special emphasis upon relief features of North America. Prerequisite: Geography 51.

114 *Weather and Climate** (3)
Rudimentary atmospheric physics, air mass and frontal weather analysis, regional climatology. Prerequisite: Geography 51.

115–16 *Physical Geography* (3–3)
Introduction to the earth sciences: form of the earth, grids and time, weather and climate, geomorphic processes and land forms, soils, vegetation, weather forecasting, map reading.

124 *Land Capabilities* (3)
Evaluation of land capabilities based on analysis of locational, physical, economic and social land characteristics. Principles of site analysis and best use. Systems of measurement of area potential.

* This course is offered off campus only.

125 *Transportation Complexes* (3)
A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.

126 *World Economies* (3)
Description and comparison of differing regional economies—pastoral, agricultural, industrial; patterns of world distribution.

146 *World Political Geography* (3)
Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.

195 *Eastern and Southeastern Asia** (3)

196 *The Soviet Union** (3)

CARTOGRAPHY

1 *Map Interpretation* (3)
Characteristics and uses of different kinds of maps and charts: geographic and grid coordinates, attributes of projections, symbolization.

11 *Cartographic Drafting and Descriptive Geometry* (3)
Spatial visualization, engineering drawing, schematic diagrams, and descriptive geometry; use of drafting and scribing instruments and materials; exercises in cartographic design and symbolization in the drafting of topographic and special-purpose maps.

12 *Topographic Surveying* (3)
Principles, methods, and instruments used in making space measurements, including layout, elements of simple curves, coordinate system, and treatment of observational errors. Prerequisite: Mathematics 12; Cartography 11. Surveying fee, $13.

13 *Higher Surveying* (3)
Elements of geodesy, triangulation, topography, hydrography, and precise trigonometric leveling. Prerequisite: Cartography 12. Surveying fee, $13.

17–18 *Elementary Photogrammetry* (3-3)
Principles, methods, and instruments used in photographic surveying and production of maps, photographic interpretation, principles of stereoscopy. Prerequisite: Cartography 13.

110 *Map Projections* (2)
Characteristics, mathematical development, and practical construction of major map projections and grid systems. Prerequisite: Mathematics 22; Cartography 13.

111 *Map Reproduction* (1)
Theory of photographic process, photographic optics, emulsions, developers, lenses, offset lithographic process, line and half tone reproduction, single and multi-color photolithographic reproduction. Prerequisite: Chemistry 11–12.

155 *Elementary Geodesy* (3)
Development of principles and formulas basic to theoretical and applied geodesy, with application to representative problems. Prerequisite: Mathematics 24.

156 *Geodetic Astronomy* (3)
Development and application of principles and formulas for the astronomic determination of latitude, longitude, and azimuth. Prerequisite: Cartography 155.

160 *Theory of Errors and Geodetic Adjustments* (3)
Separation of random and systematic errors, distribution of errors, Gaussian and Poisson distribution, fundamentals of matrix algebra with special emphasis on least squares adjustment of geodetic networks. Prerequisite: Cartography 155.

* Regional survey.

191–92 *Map and Chart Construction* (3–3)
Theory and practice in the various phases of map and chart construction; practice in the preparation of original maps and charts for reproduction. Prerequisite: Cartography 156.

OCEANOGRAPHY

101–2 *Introductory Oceanography* (3–3)
An introduction to oceanography: general characteristics of ocean basins, properties of sea water, thermal structure, waves, currents, submarine geology, tides, plant and fish ecology, new developments in oceanography based on a review of the current literature. Prerequisites: Chemistry 11–12; and Physics 11, 14, 15.

GEOLOGY

Chairman: Geza Teleki, Ph.D., Professor of Geology, Building C, Room 5 (2029 G Street NW.), FEderal 8-0250, Extension 517

3 *Introductory Geology* (3)
A survey course covering the principles of geology. (A nonlaboratory course for Off-Campus students only.)

4 *Introductory Geology* (3)
Geological periods, evolution of life on earth. (A nonlaboratory course for Off-Campus students only.)

103–4 *Geology for Engineers* (3–3)
Prerequisite: 6 hours of Mathematics or Survey of Science or permission of instructor

105–6 *Fundamentals of Geophysics* (3–3)
Survey of the theories and methods of investigation used in determining the constitution and dynamics of the earth, its oceans, and atmosphere. (It is recommended that students take Geology 3, 4: *Introductory Geology*, or the equivalent.) Prerequisite: Geography 113.

GERMANIC LANGUAGES AND LITERATURES

Chairman: Wolfram Karl Legner, Ph.D., Professor of German, Monroe Hall, Room 405 (2115 G Street NW.), FEderal 8-0250, Extension 282.

1–2 *First-year German* (3–3)
A year course: credit is not given for the first half until the second half is completed.
The essentials of German grammar; translation of easy prose.

3–4 *Second-year German* (3–3)
A year course: credit is not given for the first half until the second half is completed.
Selections from modern German prose; continuation and review of grammar. Prerequisite: German 1–2 or two years of high school German.

9–10 *German Conversation and Composition* (3–3)
Aural training and oral practice.

HISTORY

Chairman: Roderic Hollett Davison, Ph.D., Professor of European History, Hall of Government, Room 404 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 232

39–40 *The Development of European Civilization* (3–3)
Primarily for freshmen. *First half:* the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half:* from 1715 to the present.

71–72 *The Development of the Civilization of the United States* (3–3)
Primarily for sophomores. *First half:* the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half:* from 1865 to the present.

145–46 *History of Modern Russia* (3–3)
The rise and fall of the revolutionary cycle. *First half:* Tsarist Russia in the Golden Age, 1800–1917. *Second half:* Soviet Russia and the politics of empire, since 1917.

164 *South America since Independence* (3)
Development of the independent South American states in the 19th and 20th centuries.

166 *Mexico and the Caribbean since Independence* (3)
A survey of the republics of Mexico, Central America, and the Caribbean islands.

172 *Social History of the United States* (3)
Daily life, institutions, intellectual and artistic achievements of the Urban-Industrial Era, 1861 to the present.

181–82 *Diplomatic History of the United States* (3–3)
Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. *First half:* to 1898. *Second half:* since 1898.

183 *Oversea Expansion of the United States* (3)
The political, economic, social, and cultural life of our outlying possessions.

246 *Seminar in Eurasian History* (3)

282 *Seminar in the Diplomatic History of the United States* (3)

HOME ECONOMICS

Chairman: Kathryn Towne, A.M., Professor of Home Economics, Building B, Room 23 (2024 G Street NW.), FEderal 8-0250, Extension 363

173 *Home Furnishings* (3)
A course for teachers in house furnishings as part of the environment of modern home life; the role of beautiful homes in the development of ideals and value scales; the choice of materials in the light of family means.

JOURNALISM

Chairman: Ross Pelton Schlabach, Jr., M.S., Professor of Journalism, Monroe Hall, Room 426 (2115 G Street NW.), FEderal 8-0250, Extension 379

141 *General Editing for Publication* (3)
Editing procedures and techniques, proof reading, titles, arrangement, layout, type uses. Intended for students preparing for trade publications and public relations work rather than newspaper work.

145 *Principles and Problems of Public Relations* (3)
Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs.

MATHEMATICS*

Chairman: Nels David Nelson, Ph.D., Professor of Mathematics, Monroe Hall, Room 422 (2115 G Street NW.), FEderal 8-0250, Extension 388

3 *College Algebra* (3)
Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

* No courses numbered 1 to 100 are available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.
Graduate credit may not be given for courses numbered 101 to 200 without the permission of the Chairman of the department.

6 *Plane Trigonometry* (3)
Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

21 *Calculus I* (3)
Elementary concepts of analytic geometry. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite: Mathematics 3 and 6; or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or the equivalent.

22 *Calculus II* (3)
Differentiation and integration of transcendental functions and applications; conics; parametric equations; techniques of integration. Prerequisite: Mathematics 21.

23 *Calculus III* (3)
Vector concepts; improper integrals; solid geometry; partial differentiation and applications. Prerequisite: Mathematics 22.

24 *Calculus IV** (3)
Multiple integration with application; infinite series; differential equations. Prerequisite: Mathematics 23.

30 *Calculus II* (3)
(This course is being offered for the last time fall semester 1962–63.)
Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.

31 *Calculus III** (3)
(This course is being offered for the last time spring semester 1962–63.)
Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor).

110 *Mathematics for Meteorologists* (3)

111 *Mathematics for Engineers and Physicists I* (3)
Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 31 or 24

112 *Mathematics for Engineers and Physicists II* (3)
Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.

123 *Theory of Equations* (3)

124 *Introduction to Matrix Theory* (3)
Elementary theory of finite vector spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices.

130 *Introduction to Finite Differences* (3)
Finite integration and applications, interpolation (approximate integration), and difference equations including Seliwanoff's treatment of the homogenous equation.

132 *Differential Equations* (3)

133 *Introduction to Numerical Analysis* (3)
Digital computers, accuracy, interpolation, quadrature, numerical solution of equations including differential equations. Prerequisite: Mathematics 132 or 111.

139 *Advanced Calculus I* (3)
Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.

171 *Vector Analysis* (3)

* Mathematics 24 (or 31) is prerequisite to courses numbered 101 to 200

172 *Tensor Analysis* (3)
Review of vectors and matrices, transformation groups, curvilinear coordinates, covariant and contravariant tensors, derivatives and integrability conditions. Prerequisite: Mathematics 171.

MECHANICAL ENGINEERING

For information consult Martin Alexander Mason, B.S. in Eng., Ing.-Dr., Professor of Civil Engineering, Tompkins Hall, Room 103 (725 Twenty-third Street NW.), FEderal 8-0250, Extension 246

10 *Graphical Communication* (2)
Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course.

PHILOSOPHY

Chairman: Charles Edward Gauss, Ph.D., Elton Professor of Philosophy, Building N, Room 30 (718 Twenty first Street NW.), FEderal 8-0250, Extension 538

51–52 *Introduction to Philosophy* (3–3)
A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.

121–22 *Logic and Scientific Method* (3–3)
First half: the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of symbolic logic, the nature of a formal system. *Second half:* general analysis of the methods of investigation and reasoning used in the natural and social sciences, procedures and requirements of definition, classification and sorting, analogical and inductive inference, causal determination, the nature and function of hypothesis, measurement, principles of the theory of probability.

PHYSICAL EDUCATION

Chairman for women: Loretta May Stallings, A.M., Associate Professor of Physical Education for Women, Building H, Room 21 (714–16 Twentieth Street NW.), FEderal 8-0250, Extension 341
Chairman for men: Joseph Henry Krupa, M.S., Ed.D., Professor of Physical Education for Men, Building S, Room 11 (2025 H Street NW.), FEderal 8-0250, Extension 301

101 *Physical Education in the Elementary School* (3)
Physical growth and development of the child and adolescent. Survey of age characteristics and organizations of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

PHYSICS

Chairman: Herman Hedberg Hobbs, Ph.D., Associate Professor of Physics, Samson Hall, Room 201 (2036 H Street NW.), FEderal 8-0250, Extension 333

11 *Introductory Physics* (3)
An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. Prerequisite: high school algebra and plane geometry. Material fee, $11.

12 *Introductory Physics* (3)
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Mechanics, wave-motion, and sound. Prerequisite: Physics 11 (or former Physics 5). Material fee, $11.

13 *Introductory Physics* (3)
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Elementary electricity and magnetism. Prerequisite: Physics 11. Material fee, $11.

14 *General Physics* (3)
Laboratory (2½ hours). Mechanics, wave-motion, and sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29 or 21. Material fee, $11.

15 *General Physics* (3)
Laboratory (2½ hours). Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration: Mathematics 30 or 22. Material fee, $11.

16 *General Physics* (3)
Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30, and consent of the instructor.

102 *Heat and Thermodynamics* (3)
Fundamental concepts, heat transfer, the laws of thermodynamics with applications to physical systems. Prerequisite: Physics 16, Mathematics 31 or 24.

106 *Optics* (3)
Geometrical optics; elementary theory of wave motions; interference, diffraction, polarization, and dispersion of light; laws of black-body radiation. Prerequisite: Physics 16, Mathematics 31 or 24.

113 *Atomic Physics* (3)
Properties of elementary particles, interactions with radiation, atomic structure, optical and X-ray spectra, introduction to wave mechanics. Prerequisite: Physics 16, 101 or 105, or the equivalent; Mathematics 31 or 24.

128 *Sound* (3)
Production, propagation, and detection of sound waves; vibrations of sounding bodies; acoustic instruments and acoustic measurements. Prerequisite: Physics 16, Mathematics 31 or 24.

132 *Electronics* (3)
Lecture (2 hours), laboratory (3 hours). The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications. Prerequisite: Physics 16 and a course in d-c and a-c circuits in Physics or Engineering. Material fee, $11.

201 *Classical Physical Theory* (3)
Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171. (Mathematics 171 may be taken concurrently.)

202 *Classical Physical Theory* (3)
Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171.

POLITICAL SCIENCE

Chairman: John Withrow Brewer, Ph.D., Professor of International Law, Hall of Government, Room 208 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 684

1 *Introduction to Government* (3)
Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

9–10 *Government of the United States* (3–3)
First half: structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.

107 *Problems in Modern Political Thought* (3)
Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.

111 *Introduction to Comparative Government* (3)
Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.

112 *Introduction to Comparative Government* (3)
Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.

113 *Political Problems of the British Commonwealth of Nations* (3)
From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states in Asia and Africa.

121–22 *The Constitution of the United States* (3–3)
Judicial power of federal courts in constitutional interpretation. *First half:* emphasis on separation of powers, federal-state relationships, and taxation. *Second half:* emphasis on constitutional protection of civil rights.

145 *Political Parties and Politics* (3)
Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress.

146 *Political Pressures and Public Reactions* (3)
Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.

151–52 *Public Administration* (3–3)
Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.

171 *International Politics* (3)
Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.

172 *International Organization: the United Nations* (3)
Development and current operation of international organization within the system of soverign states with emphasis on the United Nations.

181 *International Law* (3)
Survey of the public law of nations with emphasis on the law of peace.

191 *Politics of the Middle East* (3)
Domestic and international politics of Turkey, Iran, Israel, and the Eastern Arab States and Principalities. Special attention to the specifically regional aspect of the foreign policies of these countries.

192 *Politics of North and Central Africa* (3)
Domestic and international politics of the Western Arab States, Ethiopia, Somalia, Liberia, and the newly independent states of former British, French, and Belgian Africa. Special attention to the specifically regional aspect of the foreign policies of these countries.

194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3)
Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.

212 *Seminar: Comparative Government and Politics* (3)
Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem. Attention will be directed to questions of method.

260 *Fundamentals of National Power** (3)

261 *International and United States Foreign Policy** (3)

262 *National Security Policy of the United States** (3)

283 *Topics in International Law* (3)
A consideration of theory, problems, and cases in the public law of nations, including the law of peace and the law of war.

285 *Diplomacy Since World War II* (3)
Recent changes in diplomatic procedures and objectives as compared with those of earlier periods.

297 *Readings in International Affairs* (1 to 2)

299–300 *Thesis* (3–3)

PSYCHOLOGY

Chairman: Thelma Hunt, Ph.D., M.D., Professor of Psychology, Monroe Hall, Room 427 (2115 G Street NW.), FEderal 8-0250, Extension 283

1 *General Psychology*† (3)
The fundamental principles underlying human behavior.

4 *Psychology of Adjustment* (3)
Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.

22 *Introduction to Educational Psychology* (3)
Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3)
A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

101 *Abnormal Psychology* (3)
The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.

112 *Adolescent Psychology* (3)
Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.

125 *Mental Hygiene* (3)
A course for teachers in the application of psychological principles to classroom procedures for purposes of assisting the teacher to recognize and deal with early symptoms of maladjustment.

127 *Employee Counseling* (3)
Employee counseling as a management technique and its contribution to management; a survey of its basic objectives, principles, and procedures.

129 *Introduction to Counseling and Guidance* (3)
A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.

* Available only to students in the Master of Arts in International Affairs program at the Army War College and the National War College.
† Psychology 1 is prerequisite to all other courses in psychology.

131 *Psychological Tests* (3)
A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7.

144 *Personnel Psychology* (3)
Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.

145 *Principles of Human Relations* (3)
Survey of the psychological principles involved in dealing with individuals and groups.

146 *Interpersonal Relations* (3)
The psychosocial processes involved in social interaction. The perception of other persons, social communication, small group processes, group problem-solving and change.

148 *Psychology of Advertising and Consumer Behavior* (3)
The motivational and social processes in economic behavior. Consideration of current techniques and findings in motivational research. Evaluation of the effectiveness of mass media, public relations programs, and strategies of persuasion.

149 *Human Relations in Management* (3)
A consideration of the management process in terms of human behavior, with emphasis upon group processes, leadership, social interaction, motivation, and problem-solving techniques. Material fee, $5.

151 *Social Psychology* (3)
The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.

153 *Psychological Factors in Delinquency* (3)
Historical and sociological factors in delinquency; historical attitudes toward the offender, theory, and practice; patterns of failure; early preventive measures; research in delinquency prediction; rehabilitation as team work by parents, school, community, church, and (where necessary) the institution.

156 *Psychology of Propaganda and Public Opinion* (3)
The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

209 *Seminar: Psychology of Motivation* (3)
A consideration of various theoretical approaches to the psychology of motivation and systematic concepts and experimental findings deriving from each approach.

225 *Seminar: Mental Hygiene* (3)
A study of mental health problems with special attention to needs of counselors.

231 *Test Construction* (3)
The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

244 *Seminar: Job Analysis and Evaluation* (3)

245 *Seminar: Employee Motivation and Morale* (3)
An analysis of organizational behavior, especially with regard to motivation and productivity. The implications of recent research on employee attitudes, the primary group, the effects of various patterns of supervisory leadership, the role of formal and informal organization, and job design.

246 *Seminar: Personnel Measurement Techniques* (3)
Detailed consideration of the techniques of personnel selection and performance evaluation. The use of employment tests, personal data, assessment interviews, and performance ratings.

254 *Seminar: Group Dynamics* (3)
The experimental study of small groups; autocratic and democratic group climates, interaction process analysis; Lewin's field-theoretical approach to individual and group processes.

255 *Seminar: Techniques of Opinion and Attitude Measurements* (3)
Methods of attitude measurement (interviews, questionnaires, scales, polls) as cur- rently used by private and governmental investigators. The place of attitude studies in schools, industry, government, etc.

264 *Sensitivity Training: Human Relations Laboratory Course* (3)
A sensitivity learning experience in human relations. The course is built around an unstructured group experience with opportunities for individual feedback, experimen- tation, and practice. The goal of the course is the development of self insight, situa- tional sensitivity, and diagnostic skills in human relations. Prerequisite: 9 semester hours in psychology or sociology.

265 *Theory and Design in Human Relations Training* (3)
Designed for those interested or involved in conducting human relations training. The- ories of learning are reviewed. The laboratory approach to human relations training is explored in depth. Practice in designing, developing training skills, and evaluation of training are covered. Prerequisite: Psychology 264 or a human relations laboratory learning experience.

267 *Theories of Organization* (3)
Theory and research in formal organizations. Classical, human relations, and informa- tion processing theories of organizations. The effects of organizational design on com- munication processes, leadership, decision-making, intergroup relations, small group formation, status hierarchies, productivity, motivation, and morale. Open to graduate students in psychology and graduate administrative programs.

299-300 *Thesis* (3-3)

RELIGION

Chairman: Clifton Earl Olmstead, A.B., Th.D., Professor of Religion, Building C Room 10 (2106 G Street NW.), FEderal 8-0250, Extension 279

9 *The Old Testament* (3)
A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities.

10 *The New Testament* (3)
A study of the literature of the New Testament from the standpoint of occasion, pur- pose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles.

59-60 *History of Religion* (3-3)
First half: primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. *Second half:* Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status.

191 *Christian Education in the Church* (3)
Principles of religious education; factors conditioning Christian growth; functions of family, church, community, and state.

192 *Christian Education in the Church* (3)
The unified program of the church; worship, study, and service; developing lay edu- cational leadership; housing and equipment; curriculum construction; evaluation of materials; lesson planning and teaching methods.

ROMANCE LANGUAGES AND LITERATURES

Chairman: William Graham Clubb, Ph.D., Associate Professor of French, Building A, Room 23 (2026 G Street NW.), FEderal 8-0250, Extensions 425, 426

FRENCH

1-2 *First-year French* (3–3)
A year course: credit is not given for the first half until the second half is completed. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose.

3-4 *Second-year French* (3–3)
A year course: credit is not given for the first half until the second half is completed. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Prerequisite: French 1–2 or two years of high school French.

SPANISH

1-2 *First-year Spanish* (3-3)
A year course: credit is not given for the first half until the second half is completed. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose.

3-4 *Second-year Spanish* (3–3)
A year course: credit is not given for the first half until the second half is completed. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Prerequisite: Spanish 1-2 or two years of high school Spanish.

SECRETARIAL STUDIES

Chairman: Mildred Hollander Shott, A.M., Associate Professor of Secretarial Studies, Monroe Hall, Room 300 (2115 G Street NW.), FEderal 8-0250, Extension 447

1 *Elementary Typewriting* (3)
Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms.

2 *Intermediate Typewriting* (3)
The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents. Prerequisite: Secretarial Studies 1 or the equivalent; ability to type accurately at 30 words a minute.

11 *Elementary Shorthand and Transcription* (3)
A study of the principles of Gregg shorthand correlated with dictation and transcription. *Minimum* dictation speed of 60 words a minute attained.

12 *Intermediate Shorthand and Transcription* (3)
Review of the principles of Gregg Shorthand. Dictation and transcription on general and specialized business subjects. *Minimum* dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute.

15 *Advanced Shorthand, Typewriting, and Transcription* (3)
Dictation and transcription involving vocabularies in specific businesses. *Minimum* speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent.

16 *Secretarial Shorthand, Typewriting, and Transcription* (3)
Dictation and transcription involving vocabularies used in the legal and medical professions. *Minimum* dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 15 or the equivalent.

51 *Business Correspondence* (3)
Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.

54 *Secretarial Practice* (3)
A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

SLAVIC LANGUAGES AND LITERATURES

Executive Officer: Helen Bates Yakobson, B.S., Associate Professor of Russian. Building M, Room 12 (716 Twenty-first Street NW.), FEderal 8-0250, Extension 275, 496

1–2 *First-year Russian* (3–3)
A year course: credit is not given for the first half until the second half is completed. A beginner's course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice.

1S–2S *Scientific Russian for Beginners** (3–3)
An introduction to the essentials of Russian grammar and reading of modern scientific texts.

3–4 *Second-year Russian* (3–3)
A year course: credit is not given for the first half until the second half is completed. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics.

9–10 *Russian Conversation* (3–3)
Listening comprehension and oral practice.

101–2 *Readings in Modern Russian* (3–3)
Representative Russian readings in the social sciences and periodical literature.

103–4 *Scientific Russian* (3–3)
Readings in major fields of Russian contemporary scientific literature.

SOCIOLOGY AND ANTHROPOLOGY

Acting Department Chairman: Richard Walton Stephens, Ph.D., Associate Professor of Sociology and Anthropology, Monroe Hall, Room 200 (2115 G Street NW.), FEderal 8-0250, Extension 201

SOCIOLOGY†

2 *Man, Culture, and Society II*† (3)
(Formerly Sociology and Anthropology 1)
Development of culture and personality; the impact of groups and institutions on man's social behavior. Problems and analysis of human relations in the family, industry, community, and society.

41 *American Social Problems* (3)
(Formerly Sociology and Anthropology 172)
Systematic development of the important schools of sociology, including recent European as well as American developments; an evaluation of the scientific contributions of each school

* This is a special course. It cannot serve as a prerequisite to any advanced course in Slavic Languages and Literatures

† Anthropology 1 and Sociology 2 combine to make a year course, which is prerequisite to all other courses in Anthropology and in Sociology.

125 *Social Movements* (3)
(Formerly Sociology and Anthropology 162)
Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and show the way social movements develop.

126 *Urban Sociology* (3)
The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.

131 *Social Institutions* (3)
Functional analysis of basic social institutions: family, education, religion, and state in the structure of American society.

132 *Courtship and Marriage* (3)
Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.

135 *Juvenile Delinquency* (3)
Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.

136 *Criminology* (3)
Nature and distribution of crime, police and court systems, prisons and reformatories, treatment and prevention of crime.

141 *Population Problems* (3)
Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies: eugenics and birth control.

148 *The Development of Social Theory* (3)
(Formerly Sociology and Anthropology 172)
Systematic development of the important schools of sociology, including recent European as well as American developments; an evaluation of the scientific contributions of each school.

152 *Dynamics of Culture* (3)
Factors and processes making for stability and change in cultures; "the nature and characteristics of cultural growth, invention, diffusion, and acculturation"; the integration and distintegration of cultures.

221 *Seminar: Current Trends in Sociology* (3)
Analysis and evaluation of recent developments in sociology, and an appraisal of the role of systematic theory in sociology.

263 *Culture, Contact, and Change* (3)
(Formerly Psychology 263)
Western impact on non Western cultures. The workings and the processes of social change as variant cultures and ethical systems interact.

ANTHROPOLOGY

1 *Man, Culture, and Society I** (3)
(Formerly Sociology and Anthropology 51)
Physical development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships.

142 *Physical Anthropology* (3)
(Formerly Sociology and Anthropology 142)
The biological background; the origin and races of mankind, and the social and cultural effects of concepts of race.

* Anthropology 1 and Sociology 2 combine to make a year course, which is prerequisite to all other courses in Anthropology and in Sociology.

SPEECH

Chairman: Lubin Poe Leggette, A.M., Ed.D., Depew Professor of Speech, Lisner Auditorium, Room 2 (730 Twenty-first Street NW.), FEderal 8-0250, Extension 293

1 *Effective Speaking* (3)
Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, $2.

2 *Persuasive Speaking* (3)
A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

11 *Voice and Diction* (3)
Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, $4.

111 *Effective Speech Communication** (3)
The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to speech majors.

121 *Group Discussion and Conference Leadership* (3)
The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor.

169 *Creative Dramatics* (3)
A study of creative dramatics and its use as a learning tool.

170 *Children's Theater* (3)
Theory and practice in creating and producing plays for children.

STATISTICS

Chairman: Harold Frederick Bright, Ph.D., Professor of Statistics, Hall of Government, Room 401 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 296

51 *Introduction to Business and Economic Statistics*† (3)
Lecture (2 hours), laboratory (2 hours). Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

52 *Mathematics of Finance*‡ (3)
Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

91 *Principles of Statistical Methods*‡ (3)
Lecture (2 hours), laboratory (2 hours). Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

101 *Basic Principles of Statistical Methods I* (3)
Variables and attributes, averages and dispersion, elementary principles of sampling; introduction to the making of statistical decisions. (This course is offered both on and off campus.)

* This course can be adapted to the needs of a specific group.
† Statistics 51 is offered only on campus. However, Statistics 101 and 102 *Basic Principles of Statistical Methods I and II* (3-3), which is offered off campus, may be substituted.
‡ This course is offered on campus only.

102 *Basic Principles of Statistical Methods II* (3)
Continuation of Statistics 101 and includes topics in analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 101, or permission of the instructor. (This course offered off campus only.)

104 *Statistics in Psychology and Education I* (3)
Lecture (2 hours), laboratory (2 hours). Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education.

117 *Analysis of Variance I* (3)
Lecture (2 hours), laboratory (2 hours). The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Prerequisite: Statistics 91.

ZOOLOGY

Chairman: Ira Bowers Hansen, Ph.D., Professor of Zoology, Building C, Room 302 (2029 G Street NW.), FEderal 8-0250, Extension 452

BIOLOGY*

1-2 *Introductory Biology** (4-4)
This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second and third group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2. Material fee, $10 a semester.

* Beginning with the academic year 1962-63, Biology 1-2 *Introductory Biology* (4-4) replaces Botany 1-2 *General Botany* (3-3) and Zoology 1-2 *Introduction to Zoology* (4-4).

CAMPUS OFFICE DIRECTORY

Name	Room	Extension
Accounting, Department of	Govt 103	243, 610
Addressograph	Bacon 10	575
Administrative Secretary	Bldg E	641, 642
Admissions	C-101	344
Evaluators	C-101	340
Medical School	Woodhull B	209, 540
Air Force Advanced Management Program	Govt 205	404, 588
Air Force Military and Economics Program	Govt 312	284
Air Science, Department of	Chapin	521
Alumni Office	Bacon 100	305, 369
Art, Department of	X-15	351, 423, 586
Assistant to the Dean of Faculties for Planning	E-201	241, 448
Assistant to the President: Special Projects (C. M. Farrington)	Bacon 101	412
Assistant to the President (R. S. Jordan)	Bldg E	325
Associate Dean of Faculties	E-300	494, 448
Athletics for men:		
Director of	R-10	520
Ticket office	Auditorium	417
Auditorium—Manager's office		409
Behavioral Sciences, Center for	Y-11	611
Biochemistry, Department of	MS	394
Book Store:		
Medical Book Store	1335 H St.	338
University Book Store	2120 H St.	397
Book Department	2120 H St.	460
Botany, Department of	C 401	459
Business and Public Administration, Department of	Y-12	512, 559
Hospital Administration and Health Care Programs	816 21st St.	574, 676
Business Office	D-9	311
Cashier's Office	Cor 101	327
Contract Section	Cor 101	305
Chapel, University	O 20	359
Chemistry, Department of	Samson 201	261
Cherry Tree	Stu Union	358
Civil Engineering, Department of	Tompkins 312	494
Classical Languages and Literatures, Department of	E 300	201
Columbian College of Arts and Sciences	Mon 200	344
Comptroller's Office	Samson 100	634
Payroll Section	Samson 100	615
Tabulating Section (IBM)	Samson 100	323
Voucher Section	Samson 100	448
Dean of Faculties	E 200	601
Dean for Sponsored Research	Bacon 200	471
Dramatic Activities	Aud 1st fl.	235
Economics, Department of	Govt 311	514
Editor, Academic	G 11	672
Education, Department and School of	Mon 202	527
Educational Counselor	Bacon 103	439, 481
Electrical Engineering, Department of	Tompkins 411	480, 484
Employment (nonacademic personnel)	2114 G St.	246
Engineering and Applied Science, School of	Tompkins 103	251
Engineering Administration Program	Tompkins 308	422
English, Department of	Mon 404	276, 370
English Composition	G-10	

Name	Room	Extension
Faculty Club Lounge	714 21st St.	367
Faculty Conference Room	Libr. 5th fl.	506
Faculty Dining Room	714 21st St.	368
Faculty Parking Lot	2115 H St.	549
Federal Accountant	Govt 105	629
Foreign Students, Adviser to	T-21	208
Forensic Medicine Institute	Bacon 405	408
General Studies, College of	Bldg F	441, 487
Geography, Department of	I-202	287, 298
Geology, Department of	C-5	517, 603
Germanic Languages and Literatures, Department of	Mon 405	282
Government, Business, and International Affairs, School of	Govt 204	661
Graduate Council	Bacon 201	362, 277
Guard Office	D-2	314, 618
		FE 8-0292
Hatchet	Stu Union	FE 7-1451
Health Administration:		
Castell, R. B. (Director)	Mayflower Hotel	DI 7-3000
Pugh, H. L.	P-10	365, 524
Callan, M. E.	P-10	365, 524
History, Department of	Govt 404	232
Home Economics, Department of	B-20	363
Hospital	903 23d St.	394
Hospital Administration	816 21st St.	574, 676
Hospital Parking Lot	23d and I Sts	505
Housing Office	Auditorium	472
International Affairs Program	Govt 201	684
International House	T-21	208
Intramural Sports	S-11	301
Journalism, Department of	Mon 426	379, 498
Language Workshop Supervisor	A-23	425, 609, 614
Law:		
Associate Dean	Sto 14	327, 329
		331, 332
Business Office	Sto 11	327, 329
Dean (Law School)	Sto 14	331, 332
Graduate School of Public Law	Bacon 405	408
Law Review	Bacon 409	325, 483
Legal Aid	H B H	482
National Law Center	Libr 500	576, 577
Assistant Dean	Sto 11	327, 329
Student Bar Association	H B H 11	304
Library:		
Circulation and Reference	Libr. 2d fl.	372
Law	Sto 4th fl.	326, 534
Librarian	Libr 200	268
Medical	1339 H St.	394
Periodical Room	Libr 301	273
Processing Room	Libr 203	272
Reserve Book Room	Libr 103	271
Lost and Found	Stu Union	597
Mail Room	D-9	309
Maintenance:		
Custodial Office	D-9	314, 618
Plant Engineer's Office	Q-12	310, 558
Mathematics, Department of	Mon 422	388
Measurement Science, Center for	Tompkins 103	246

Name	Room	Extension
Mechanical Engineering, Department of	Tompkins 308	251
Mecheleciv	D-H House	528
Medicine, School of	1335 H St.	394
Microbiology, Department of	MS	394
Music Program	X-2	659
Navy Graduate Financial Management Program	Govt 206	493, 242
Patent, Trade-Mark, and Copyright Foundation	Bldg Z	478, 535, 570
Patent, Trade-Mark, and Copyright Journal of Research and Education	Bldg Z	570, 478
Pharmacology, Department of	MS	394
Pharmacy, Department and School of	W-110	405
Philosophy, Department of	N-30	536
Physical Education for Men, Department of	S-11	307
Physical Education for Women, Department of	H-20	341
Physician, resident	P-10	365, 324
Physics, Department of	Samson 201	301
Physiology, Department of	MS	394
Political Science, Department of	Govt. 208	684
President's Office	Bldg E	324
Provost's Office	E-200	449
Psychology, Department of	Mon 427	283
Public Administration	Govt 205	404, 368
Public Relations	S-20	365
Reading Clinic	Binney	491, 598
Registrar	C-100	241
Religion, Department of	O-10	370
Research Projects:		
Biometric Laboratory	1145 19th St.	632
	FE 3-0113	
Chemistry Research Project	Cor 311	403
Computer Research Project	Tompkins 411	480, 481
Driver Behavior Research Project	729 22d St. 2d fl.	625, 626
		502, 573
Human Resources Research Office	Bldg D	551
	FE 8-4550	
Management Research Group	Bacon 300	604
National Aeronautics Space Administration	Tompkins 403	500
Navy Logistics Research Project	Stau	585
Population Research Project	X-10	521
Reserve Officers' Training Corps, Air Force	Chapin	
Residence Halls:		
Adams Hall	730 19th St.	579
Manager	RE 7-9503	
1st floor	EX 3-8842	
2d floor	EX 3-9033	
3d floor	EX 3-9639	
4th floor	EX 3-9637	
5th floor	ST 3-3847	
6th floor	EX 3-9544	
7th floor	EX 3-9829	
8th floor	ST 3-9650	
Basement	2100 Eye St.	
Calhoun Hall		333-9430
Manager		333-9446
1st floor		333-9483
2d floor		333-9728
3d floor		337-9654
4th floor		
5th floor		

6th floor	337-9604
7th floor	337-9613
8th floor	337-9640
Crawford Hall	2119 H St. 689
	965-2626
Hancock Hall	3665 38th St.
1st floor	WO 6-9888, 966-9659, 966-9793
2d floor	WO 6-9827, 966-9811
3d floor	WO 6-9848, 966-9897
Madison Hall	736 22d St., 561
	FE 3-9220
Strong Hall	620 21st St., 444
	338-8460
Welling Hall	814 22d St.
3d floor	FE 3-9838
4th floor	FE 3-9879

Name	Room	Extension
Romance Languages and Literatures, Department of	A-23	425, 426
Scholarships Committee, Chairman	T-10	529
Secretarial Studies, Department of	Mon 300	447
Shop	Q-12	310, 558
Plant Engineer	Q-12	558
Slavic Languages and Literatures, Department of	M-12	275, 496
Sociology and Anthropology, Department of	X-9	387, 530, 585
Speech Clinic	Aud 4	294, 295
Speech, Department of	Aud 2	293
Sports, Publicity	Bldg R	414
Statistics, Department of	Govt 401	296
Stores, University	2027 H St. rear	315
Student Activities:		
Director of (Men)	Q-10	334, 421
Director of (Women)	Woodhull	308, 316
Assistant	Stu Union	378
Student Council	Stu Union	438
Student Parking Lot No. 1	2310 Eye St.	352
Student Parking Lot No. 2	2136 Eye St.	455
Student Placement Office	2114 G St.	364
Student Union Cafeteria	Stu Union	553
Student Union Office	Stu Union	597
Summer Sessions	T-12	360, 547
Testing and Counseling Center	N-10	463
Treasurer	Cor. 102	221
Contract Research	Cor 102	580
University Development	Bacon 101	412
University Students, Division of	Man 201	205
Veterans Education	Q-10	334, 330
WRGW	Aud	686
Zoology, Department of	C-302	452

INDEX

A

Absence, regulations concerning
See Attendance
Academic status of the University, 7
Accounting courses, 75–76
Administration, Officers of:
The University, 2
The College of General Studies, 8
Administrative Assistants, 8–9
Admission, 18–21, 68, 73, 74
Advanced Standing, 20, 32, 35, 39, 41
Amount of Work, 23
Anthropology courses, 101
Armed Forces Section, Campus Division, 68–69
Art course, 77
Attendance, 23, 28
Auditing, 18–19, 26

B

Biology course, 77, 103
Board of Trustees, 1
Business Administration courses, 78–80
Business and Public Administration courses, 77–78

C

Calendar for 1962–63, ii–iv
Campus Division, 68–69
Campus Office Directory, 104–7
Candidacy for degree, special requirements, 20–21
Cartography courses, 89–90
Changes in program of studies, 25–26
Chemistry courses, 82
Colleges, Schools, and Divisions, of the University, 6–7
Committees of the College of General Studies, 16
Community Services, Division of, 69–73
Comprehensive examinations for Master's degree, 42
Concurrent registration, 19
Correspondence courses, 21, 33–34, 35, 39
Counseling service, 30–31, 40
Course numbers, explanation of, 75
Courses of Instruction, 75–103

D

Dean's Council, 16
Dean's List, 28
Degrees:
Associate in Arts, 32–33
Associate in Science, 33–34
Associate in Secretarial Administration, 34–35
Bachelor of Arts, 35–37
Bachelor of Business Administration, 37–38
Bachelor of Science in Cartography, 38–39
Master of Arts, 40–45
In the field of Financial Management, 42–43
In the field of Governmental Administration, 43
In the field of Personnel Administration, 43–45
Master of Arts in International Affairs, 45
Master of Business Administration, 45–46
Master of Public Administration, 46–47
Departmental majors, 37
Dishonesty, 29
Divisional organization, 36–37
Dropping courses, 25–26

E

Economics courses, 82–83
Education:
Courses, 83–87
Directors of area instruction, 66–67
English courses, 87–88
Examinations:
Comprehensive for Master's degree, 42
For waiving curriculum requirements, 21
General Educational Development tests, 21, 35, 39
Graduate Record, iii, iv, 27–28
Validating, 21, 33–34, 35, 39

F

Fees:
Application, 22
Application for transfer, 22
Graduation, 22
Payment of, 22–23
Reading Clinic, 73–74
Refund of, 23
Residence, 22
Testing and Counseling Center, 31
Tuition, 22, 74
Validating examination, 21, 22
French courses, 99

G

General Studies curriculum, 32–33, 36–37
General Educational Development tests, 21, 32–34, 35, 39
Geography courses, 88–90
Geology courses, 90
German courses, 90
Grades, 24

Graduate Record Examinations, iii, iv, 27–28
Graduation:
  Application for, 27
  Requirements, 27–28

H

History:
  Courses, 90–91
  Of the University, 5–6
Home Economics course, 91
Honors, 28–29
Hospital Administration course, 81

I

Independent Study, 24
"In residence" status, 22, 27
In-service Training Program, 17, 69
Institutes, Conference, and Special Programs, 74
Instruction, Staff of, 9–16

J

Journalism courses, 91

L

Languages and Literatures, Division of, 36
Leave of absence, 27
Library, 29
Location:
  College of General Studies office, 17
  Off-Campus Centers, 47–67
  The University, 7

M

Mathematics and Physical Sciences, Division of, 36
Mechanical Engineering course, 93
Military transfer of students, 27

N

Natural Science, Division of, 36

O

Oceanography course, 90
Off-Campus Centers, 47–67
Off-Campus Division, 17–67
  Admission to course work, 18–19
  Admission to degree candidacy, 19, 35, 40–41
  Armed Forces Section, 68–69
  Education courses for teachers, 66–67
Organization of courses, 17
Organization of the College of General Studies, 17

P

Philosophy courses, 93
Physical Education course, 93
Physics courses, 93–94
Political Science courses, 94–96
Probation, 25
Psychology courses, 96–98
Public Administration courses, 81–82

Q

Quality-Point Index, 24

R

Radio courses, 18
Reading Clinic, 73–74
Readmission, 25
Regulations, 23–29, 69
Religion courses, 98
Residence requirements, 27, 31, 36, 41
Right to change rules, 29
Right to dismiss students, 29
Romance Languages and Literatures courses, 99
Russian courses, 100

S

Scholarship requirements, 24–25, 27, 32, 36, 41
Secretarial Studies courses, 99–100
Service schools, credit for, 21, 33–34, 35, 39
Slavic Languages and Literatures courses, 100
Social Sciences, Division of, 37
Sociology courses 100–101
Spanish courses, 99
Speech courses, 102
Special Program directors, 8–9
Staff of Instruction, 9–16
Statistics courses, 102–3
Suspension, 25

T

Teachers, Education courses for, 66–67
Television courses, 17–18
Testing and Counseling Center, 31
Thesis, 28, 41
Transcripts of record, 26
Transfer:
  From other institutions, 20, 35, 41
  Within the University, 26
Trustees, Board of, 1

V

Veterans Education, 30
Vocational Programs, 33–35

W

Warnings, 24–25
Withdrawals, 25–26

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1959

THE LAW SCHOOL, 1865

THE GRADUATE SCHOOL OF PUBLIC LAW, 1959

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS, 1928

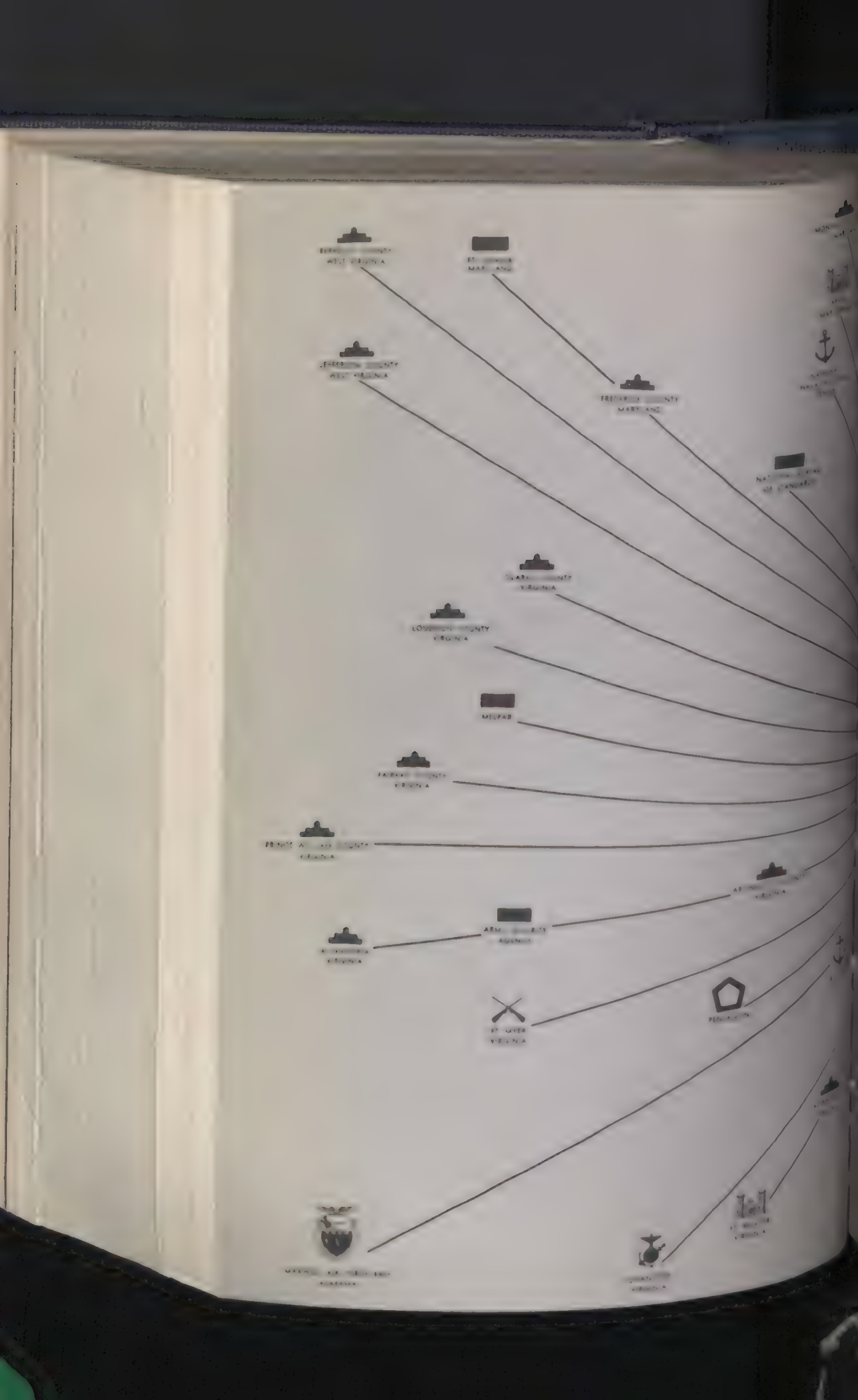
THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF AIR SCIENCE, 1951

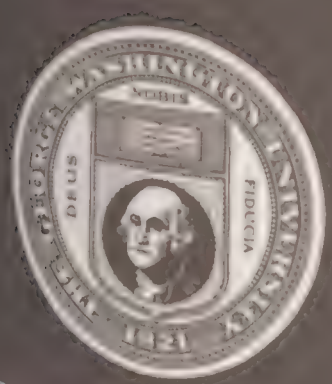
THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898



The George Washington University

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THE SCHOOL OF BUSINESS, AND AFFAIRS

GOVERNMENT, INTERNATIONAL 1962-63

WASHINGTON 6, D. C.
JUNE 1962
Vol. LXI No. 13

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

Admission.....Director of Admissions, Building C

Air Science (ROTC).....Director of Air Science, Chapin Hall

Alumni Association.....Alumni Office, Bacon Hall

Foreign Students.....Adviser to Foreign Students, Building T

Graduate Study

In Arts and Sciences

Master's degrees.....Dean of Columbian College of Arts and Sciences

Doctor of Philosophy.....Dean of The Graduate Council

In Education.....Dean of The School of Education

In Engineering.....Committee on Graduate Studies, School of Engineering

In Law.....Dean of The Graduate School of Public Law

In Accounting, Business Administration, Business and Economic Statistics, Economic Policy, Hospital Administration, International Affairs, Personnel Administration, Public Administration, and Public Affairs.....Dean of the School of Government, Business, and International Affairs

Housing

Men.....Director of Men's Activities, Building Q

Women.....Director of Women's Activities, Woodhull House

Scholarships.....Chairman, Committee on Scholarships, Building T

Student Employment.....Student Placement Office, 2114 G Street NW.

Summer Sessions.....Dean of the Summer Sessions, Building T

Transcripts of Records.....Registrar, Building C

Veterans Education.....Director of Veterans Education, Building Q

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1962

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	....	....	....	....

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October

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1963

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August

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September

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October

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November

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December

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THE CALENDAR 1962–63

Fall Semester:

Advising: all new students	Sept. 10–19 ..... Mon.–Wed.
Orientation Assembly: all new students	Sept. 14 ..... Fri.
Curriculum assemblies: new students attend one	Sept. 14 and 17 .... Fri. and Mon.
Placement tests	Sept. 18 ..... Tues.
Qualifying examinations	Sept. 18 ..... Tues.
Registration	Sept. 20–22* ..... Thurs.–Sat.
Classes begin	Sept. 24 ..... Mon.
Subjects of Master's theses of Feb. candidates due in Dean's Office	Oct. 5 ..... Fri.
Application for Feb. graduation due in Registrar's Office	Oct. 31 ..... Wed.
Veterans Day. Holiday	Nov. 12 ..... Mon.
Thanksgiving recess	Nov. 22–24 ..... Thurs.–Sat.
D.B.A. dissertations of Feb. candidates due	Nov. 30 ..... Fri.
Graduate Record Examination	Dec. 8 ..... Sat.
Christmas recess	Dec. 22–Jan. 2 ..... Sat.–Wed.
Classes resume	Jan. 3 ..... Thurs.
Master's theses of Feb. candidates due in Dean's Office	Jan. 3 ..... Thurs.
Last day of fall-semester classes	Jan. 16 ..... Wed.
Examination period	Jan. 21–26 ..... Mon.–Sat.

Spring Semester:

Placement tests	Jan. 30 ..... Wed.
Qualifying examinations	Jan. 30 ..... Wed.
Registration	Jan. 31–Feb. 2† ..... Thurs.–Sat.
Spring-semester classes begin	Feb. 4 ..... Mon.
Subjects of Master's theses of June candidates due in Dean's Office	Feb. 8 ..... Fri.
Winter Convocation. Holiday	Feb. 22 ..... Fri.
Application for June graduation due in Registrar's Office	Feb. 28 ..... Thurs.
Application for 1963–64 fellowships due	March 1 ..... Fri.
D.B.A. dissertations of June candidates due	March 29 ..... Tues.
Application for 1963–64 scholarships due	April 1 ..... Mon.

* September 20 and 21, from 12:00 to 8:00 P.M.; September 22, from 10:00 A.M. to 1:00 P.M.

† January 31 and February 1, from 12:00 to 8:00 P.M.; February 2, from 10:00 A.M. to 1:00 P.M.

Graduate Record Examination	April 6	Sat.
Easter recess	April 12–17	Fri.–Wed.
Master's theses of June candidates due in Dean's Office	May 1	Wed.
Last day of spring-semester classes	May 15	Wed.
Examination period	May 20–25	Mon.–Sat.
Memorial Day. Holiday	May 30	Thurs.
Baccalaureate Service	June 2	Sun.
Commencement	June 5	Wed.

SUMMER SESSIONS:

Registration for eight-week term	June 17	Mon.
Classes begin	June 18	Tues.
Independence Day. Holiday	July 4	Thurs.
Eight-week term ends	Aug. 9	Fri.
REGISTRATION FOR FALL SEMESTER 1963–64	Sept. 19–21	Thurs.–Sat.

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[a] Nominated by the alumni.

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William David Johnson, B.S. in B.A., *Comptroller*
Charles William Cole, Ph.D., *Dean of the Summer Sessions*
Benjamin Douglass Van Evera, Ph.D., Sc.D., *Dean for Sponsored Research*
Virginia Randolph Kirkbride, A.M., Ed.D., *Director of Activities for Women*
Paul Vernon Bissell, Ph.D., *Director of Activities for Men; Director of Veterans Education*
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Robert Faris, B.S., *Director of Men's Athletics*
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Kurt London, Ph.D., *Director, Institute for Sino-Soviet Studies*

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington.

The purpose of The George Washington University expressed in the words of the Bill of Incorporation, introduced and subsequently enacted by Congress in 1821, was to realize "the aspirations of Washington, Jefferson, and Madison, for the erection of a university at the seat of the Federal Government." This central idea of a university functioning in the Capital of the Nation, nonsectarian, free of sectional limitations, conscious of its wide American relationships, and open to the ever-increasing international influences which bear upon it, has been continuous through nearly a century and a half.

The purpose of this University, therefore, has been to develop the university ideal in the place of greatest national significance, flexible before the changing needs of its growing national constituency and loyal to the traditional principles of learning and research, in providing through disciplined reason, wisdom for the individual and his society.

The University as it is now organized consists of Columbian College of Arts and Sciences; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools of Medicine; Law; Engineering; Pharmacy; Education; and Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an ex officio member of the Board.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another. The University is on the approved list of the American Association of Universiy Women and is a member of the College Entrance Examination Board.

LOCATION

The University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

EDUCATIONAL FACILITIES

Buildings, grounds, and equipment are valued at approximately $27,000,000.

The buildings of Columbian College of Arts and Sciences; the Graduate Council; the National Law Center; the Law School and the Graduate School of Public Law; the School of Engineering; the School of Pharmacy; the School of Education; the School of Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; the University Hospital and Outpatient Department; and the Cancer Clinic are located between Nineteenth and Twenty-fourth Streets and between Pennsylvania Avenue and G Street NW. The School of Medicine is at Fourteenth and H Streets NW. The buildings of the University are as follows:

John Quincy Adams Hall, 730 Nineteenth Street. Residence hall for men.

Bacon Hall, 2000 H Street. Named in honor of the late Joel Smith Bacon, President of the University from 1843 to 1854. Offices of the Dean of the Graduate Council, the Dean of the Graduate School of Public Law, the Dean for Sponsored Research, the Assistant to the President (Special Projects), the Development Division, the Forensic Medicine Institute, the Management Research Group, the Educational Counselor. Offices and lounge for the Law Faculty; the Alumni Office; Alumni Reception Room.

Binney Hall, 2018 Eye Street. Named in honor of the late Joseph Getchell Binney, President of the University from 1855 to 1858. Offices, classrooms, and laboratories of the Reading Clinic.

John C. Calhoun Hall, 2100 Eye Street. Residence hall for men.

Chapin Hall, 2128 H Street (rear). Named in honor of the late Stephen Chapin, President of the University from 1828 to 1841. Offices and classrooms of the Air Force ROTC.

Corcoran Hall, 725 Twenty-first Street. Named in honor of the late William W. Corcoran, benefactor of the University and a former member of the Board of Trustees. Offices of the Treasurer, the Cashier, the departments of Chemistry and Physics; Chemistry Research Project; the chemistry and physics laboratories; classrooms.

William H. Crawford Hall, 2119 H Street. Residence hall for women.

Davis-Hodgkins House, 731 Twenty-second Street. Offices and lounges of engineering students' organizations.

Everglades Apartments, 2223 H Street. Residence hall for nurses.

Faculty Club House, 714 Twenty-first Street.

Gymnasium, 2010–12 H Street.

Hall of Government, 710 Twenty-first Street. The gift of the late Mrs. Henry Alvah Strong, former Trustee of the University. Offices of the Dean and the Assistant Dean of the School of Government, Business, and International Affairs; the departments of Accounting, Business and Public Administration, Economics, History, Political Science, and Statistics. Offices of the Air Force Advanced Management Program, Air Force Military and Economics Program, and Navy Graduate Financial Management Program; classrooms.

Harlan-Brewer House, 1923 H Street. Offices of law student organizations; lounges, reading rooms.

Health Care and Hospital Administration Building, 816 Twenty-first Street. Offices and seminar rooms of Health Care and Hospital Administration Program.

Hospital and Outpatient Department, Washington Circle.

Hospital Staff Office Building, 818 Twenty-second Street.

International House, 2110 G Street. Office of the Adviser to Students from Foreign Countries; club rooms.

Lisner Auditorium, 730 Twenty-first Street. The gift of the late Abram Lisner, former Trustee of the University. The Auditorium; Lisner Lounge; offices and classrooms of the Department of Speech, the Speech Clinic, and the housing officer; Athletic Ticket Office.

Dolly Madison Hall, 736 Twenty-second Street. Residence hall for women.

James Monroe Hall, 2115 G Street. Offices of the deans of Columbian College of Arts and Sciences, the Division of University Students, the School of Education; the departments of Education, English (English and American Literature), Germanic Languages, Journalism, Mathematics, Psychology, and Secretarial Studies; classrooms.

Office of the President, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Assistant to the President, Associate Dean of Faculties, Administrative Secretary, Assistant to the Dean of Faculties for Planning, and department of Classical Languages.

Placement Office, 2114 G Street.

Samson Hall, 2036 H Street. Named in honor of the late George Whitefield Samson. President of the University from 1859 to 1871. Comptroller's Office; Disbursing Office; offices of the departments of Chemistry, Geology, and Physics.

School of Medicine, 1335–1339 H Street. Offices of the Dean and Staff of the School of Medicine; the Medical Library; laboratories; lecture rooms; research laboratories; student and faculty lounges; and University Medical Bookstore.

Sorority Halls:

2112 G Street. Apartments of Kappa Alpha Theta and Kappa Delta sororities.

2129 G Street. Apartments of Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Zeta Tau Alpha, and Kappa Kappa Gamma sororities.

2131 G Street. Apartment of Delta Gamma Sorority.

2137 F Street. Apartment of Alpha Epsilon Phi Sorority.

802 Twenty-first Street. Apartment of Phi Sigma Sigma Sorority.

Staughton Hall, 707 Twenty-second Street. Named in honor of the late William Staughton, President of the University from 1821 to 1827. Offices and laboratories of the Navy Logistics Research Project.

Stockton Hall, 720 Twentieth Street. Named in honor of the late Rear Admiral Charles Herbert Stockton, President of the University from 1910 to 1918. Law School; offices of the National Law Center and the Dean and Faculty of the Law School; library; and lecture halls.

Hattie M. Strong Hall, 620 Twenty-first Street. Named in honor of the donor, the late Mrs. Henry Alvah Strong, former Trustee of the University. Residence hall for women.

Student Union, 2125 G Street. Offices of student organizations, student cafeteria and snack bar, reading room, lounge, game and music room, and the "Lost and Found" Office.

Tompkins Hall of Engineering, 725 Twenty-third Street. The gift of the late Charles H. Tompkins, former Trustee of the University. Offices of the Dean of the School of Engineering; the departments of Civil, Electrical, and Mechanical Engineering; the programs in Engineering Administration, Engineering Science, and Metrology; the Center for Measurement Science; Electronics Research Project, Computer Research Project, National Aeronautics Space Administration; Engineering testing laboratories, general laboratories, drafting rooms, and classrooms.

University Book Store, 2120 H Street. University Medical Bookstore, 1335 H Street.

University Library, 2023 G Street. The gift of the late Abram Lisner, former Trustee of the University. The library, rooms of the Board of Trustees, Faculty Conference Room, classrooms, office of the Dean of the National Law Center.

The Helen L. and Mary E. Warwick Memorial Building, 2300 K Street. Diagnostic and treatment rooms, and research laboratories of The George Washington University Cancer Clinic.

Welling Hall, 814 Twenty-second Street. Named in honor of the late James Clarke Welling, President of the University from 1871 to 1894. Residence hall for men.

Woodhull House, 2033 G Street. Gift of the late General Maxwell Van Zandt Woodhull, former Trustee of the University. Office of the Director of Activities for Women; meeting rooms for student activities.

Building A, 2026 G Street. Offices of the Department of Romance Languages.

Building B, 2024 G Street. Offices, laboratories, and classrooms of the Department of Home Economics.

Building C, 2029 G Street. Offices of the Registrar and the Director of Admissions; offices and laboratories of the departments of Botany, Geology, and Zoology; language laboratories; classrooms.

Building D, 2013 G Street. Offices of the Business Manager, Maintenance; Mail Room; Human Resources Research Project.

Building E, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Assistant to the President, Associate Dean of Faculties, Administrative Secretary, Assistant to the Dean of Faculties for Planning; office of the Department of Classical Languages.

Building F, 706 Twentieth Street. Offices of the Dean of the College of General Studies.

Building G, 712 Twentieth Street. Offices of the Department of English (Composition section); Academic Editor.

Building H, 714–16 Twentieth Street. Offices and locker rooms of the Department of Physical Education for Women.

Building I, 2135 G Street. Offices, classrooms, and laboratories of the Department of Geography.

Buildings J and L, 2131 and 2129 G Street (rear). Classrooms and locker rooms of the Department of Physical Education for Women.

Building K, 817 Twenty-third Street. Classroom, playing court, locker rooms, and office of the Department of Physical Education for Women.

Buildings M and N, 716–18 Twenty-first Street. Offices of the departments of Slavic Languages and Philosophy; offices and laboratories of the Testing and Counseling Center.

Building O, 2106 G Street. Offices of the Department of Religion and University Chapel.

Building P, 2108 G Street. Offices of the Student Health Service and the Dean of the Division of Special Students.

Building Q, 2029 H Street. Offices of the Director of Activities for Men, the Director of Veterans Education, and the Superintendent of Maintenance.

Building R, 2027 H Street. Offices of the Director of Athletics, and the Athletic Staff.

Building S, 2025 H Street. Offices of the Department of Physical Education for Men and Public Relations.

Building T, 2110 G Street. Offices of the Dean of the Summer Sessions; Chairman of Committee on Scholarships; International House (see International House).

Building U, 729 Twenty-second Street. Driver Behavior Research Project.

Building V, 2114 H Street. Research laboratories of the Department of Physics.

Building W, 2128 H Street. Offices of the Dean and Faculty of the School of Pharmacy; pharmacy laboratories; classrooms.

Building X, 2107 H Street. Offices of the departments of Art and Sociology and Anthropology; Music Program; Population Research Project; Faculty offices.

Building Y, 802 Twenty-first Street. Offices of the Department of Business and Public Administration, Center for Behavioral Sciences.

Building Z, 708 Twenty-second Street. Offices of the Patent, Trade-Mark, and Copyright Foundation.

LIBRARY FACILITIES

The Library collections of the University are housed in the University Library and in the departmental libraries of law and medicine.

These collections contain approximately 361,100 volumes—278,600 in the University Library, 58,000 in the Law Library, and 24,500 in the Medical Library. Approximately 10,000 volumes a year are added to the Library's resources. Endowments, supplementing the University appropriation, provide books in the fields of American civilization, American Literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive 2,100 periodicals.

Information concerning the use of the Libraries may be obtained at the Library service desks. A classified list on cards of selected recent acquisitions is available at frequent intervals, in addition to the complete information in the card catalogue. Monthly art exhibits are held on the first and second floors of the University Library during the academic year.

The hours of the University Library and the Law Library are Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.; Sunday, 2:00 to 6:00 P.M. The Medical Library is open Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.

The student has access to the Library of Congress, the Public Library of the District of Columbia and its branches, the library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many of the other great special collections of the government departments.

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

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Leon Gintzig, Ph.D., *Associate Professor of Hospital Administration*
Dean Kemple Good, A.B., M.B.A., *Lecturer in Business Administration*
Cecil Earnest Goode, M.S., *Associate Professorial Lecturer in Public Administration*
Wood Gray, Ph.D., *Professor of American History*
Samuel Greenhouse, Ph.D., *Professorial Lecturer in Statistics*
Robert Edmund Griffiths, A.B., M.H.A., *Assistant Professor of Hospital Administration*
Lloyd William Hamilton, A.B., LL.B., *Professorial Lecturer in Accounting*
Hans Heymann, Jr., M.I.A., *Professorial Lecturer in Economics*
Frank Higginbotham, M.S., C.P.A., *Professorial Lecturer in Accounting*
Thomas Willard Holland, LL.B., Ph.D., *Professor of Labor Economics*
Charles Edwin Houston, Ph.D., *Professorial Lecturer in Business Administration*
Henry Furness Hubbard, Ph.D., *Professorial Lecturer in Psychology*
Thelma Hunt, Ph.D., M.D., *Professor of Psychology*
George Idelson, B.S., *Associate Professorial Lecturer in Business Administration*
Gilbert Chester Jacobus, B.S. in C.E., M.B.A., LL.B., *Professor of Public Administration*
Joe Lee Jessup, M.B.A., *Professor of Business Administration*
Arlin Rex Johnson, Ph.D., *Professor of Business Administration; Director, Navy Graduate Financial Management Program*
Robert Smith Jordan, Ph.D., D.Phil., *Associate Professor of International Affairs*
Robert Kaye, D.B.A., *Professorial Lecturer in Business Administration*
Elmer Louis Kayser, Ph.D., LL.D., *Professor of European History*
*John Whitefield Kendrick, Ph.D., *Professor of Economics*
Ralph Dale Kennedy, Ph.D., *Professor of Accounting*
Wolfgang Herbert Kraus, Dr. Jur., S.J.D., *Professor of Political Science*
Joseph Leo Krieger, Ph.D., *Professorial Lecturer in Business Administration*
Solomon Kullback, Ph.D., *Professor of Statistics*
Frederick Charles Kurtz, M.B.A., C.P.A., *Associate Professor of Accounting*
Arthur David Larson, A.M., *Assistant Professor of Public Administration*
Hugh Linus LeBlanc, Ph.D., *Associate Professor of Political Science*
Wolfram Karl Legner, Ph.D., *Professor of German*
Edwin Lewis, M.B.A., *Professor of Accounting*
Verne Bruce Lewis, Ed.B., A.M., *Associate Professorial Lecturer in Public Administration*
Gordon Leslie Lippitt, B.D., Ph.D., *Professor of Behavioral Sciences; Director, Center for Behavioral Sciences*
Kurt London, Ph.D., *Professor of International Affairs; Director, Institute for Sino-Soviet Studies*

* On sabbatical leave fall semester 1962–63.

Howard Rowland Ludden, A.M., *Associate Professor of Political Science*
Kenneth Frederick McClure, M.S., LL.B., *Professorial Lecturer on Commercial Law*
Edward McGrensky, Ed.M., *Professorial Lecturer in Public Administration*
Kenneth McDonald, A.B., B.Litt., *Assistant Professor of International Affairs*
Clarence Arthur McLaughlin, B.S., LL.B., *Professorial Lecturer in Accounting*
Floyd Kendrel McTyier, M.C.S., *Associate Professorial Lecturer in Hospital Administration*
Howard Maxwell Merriman, Ph.D., *Professor of American Diplomatic History*
John Anthony Morrow, A.M., *Associate Professorial Lecturer in Business Administration*
James Norman Mosél, A.M., *Associate Professor of Psychology*
Joseph Patrick Murphy, A.B., LL.B., LL.M., *Professorial Lecturer in Business Administration*
Benjamin Nimer, Ph.D., *Associate Professor of Political Science*
Montell Ernest Ogdon, Ph.D., *Professorial Lecturer in Business Administration*
Harry Robert Page, M.B.A., *Assistant Professor of Business Administration*
William Jackson Peeples, B.S., M.D., M.P.H., *Professorial Lecturer in Hospital Administration*
Ross Pollock, A.M., *Associate Professorial Lecturer in Public Administration*
Leonard Prestwich, Ph.D., *Associate Professor of Business Administration*
John Provan, M.S., *Associate Professorial Lecturer in Business and Public Administration*
Floyd Millard Riddick, Ph.D., *Professorial Lecturer in Political Science*
Wilson Emerson Schmidt, Ph.D., *Professor of Economics*
Felix Ira Shaffner, Ph.D., *Professorial Lecturer in Business Administration*
Clark Simpson, M.C.S., *Professorial Lecturer in Accounting*
John William Skinner, Ph.D., *Associate Professor of Economics*
Charles Henry Slayman, Jr., LL.B., *Lecturer in Political Science*
James Rodney Snitzler, M.B.A., Ph.D., *Associate Professorial Lecturer in Business Administration*
Waldo Sommers, Ph.D., *Professor of Public Administration; Director, Air Force Advanced Management Program*
William Spencer, A.M., *Associate Professorial Lecturer in Political Science*
Andrew Charles Stedry, Ph.D., *Lecturer in Business Administration*
Ira Ernest Steele, A.M., *Professorial Lecturer in Accounting*
Joseph Novak Stonesifer, A.M., *Professorial Lecturer in Business Administration*
Hiram Miller Stout, Ph.D., *Professor of International Affairs*
Karl Ernest Stromsem, Ph.D., *Professorial Lecturer in Public Administration*
William Lonsdale Tayler, Ph.D., *Professor of International Affairs*
Raymond Edward Thomas, A.M., *Assistant Professor of Statistics*
Ronald Bettes Thompson, Ph.D., *Professor of European History*
William George Torpey, Ph.D., *Professorial Lecturer in Public Administration*
Donald Stevenson Watson, Ph.D., *Professor of Economics*
*Harland Walter Westermann, Ph.D., *Associate Professor of Geography*
Archibald Mulford Woodruff, Ph.D., *Professor of Business Research; Dean of the School of Government, Business, and International Affairs*
Helen Bates Yacobson, B.S., *Associate Professor of Russian*
Ralph Aubrey Young, M.B.A., Ph.D., *Professorial Lecturer in Economics*

* On leave of absence 1962-63.

COMMITTEES*

DEAN'S COUNCILS

For Programs in Business and Public Administration

R. B. Eastin, F. H. Gibbs, A. R. Johnson, R. D. Kennedy, Waldo Sommers

For Programs in Public and International Affairs

H. F. Bright, W. H. Kraus, H. L. LeBlanc, H. M. Merriman, Wilson Schmidt

COMMITTEE ON ADMISSION AND ADVANCED STANDING

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COMMITTEE ON CURRICULUM AND PROGRAMS

J. W. Brewer *(Chairman)*, J. C. Dockeray, A. R. Johnson, E. H. Johnson, R. D. Kennedy, D. S. Watson

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EXECUTIVE COMMITTEE OF THE CENTER FOR THE BEHAVIORAL SCIENCES

B. D. Van Evera *(Chairman)*, J. C. Dockeray, Thelma Hunt, C. D. Linton, G. L. Lippitt, J. R. Sizoo, R. W. Stephens, A. M. Woodruff, Leon Yochelson

GENERAL INFORMATION

INTRODUCTORY

The School of Government, Business, and International Affairs was established in 1898 as the School of Comparative Jurisprudence and Diplomacy. In 1928 it was reorganized and broadened as the School of Government. During the next two decades the scope of the School broadened further with the addition of programs in business administration and public administration. In the same period the School gradually changed from primary emphasis on undergraduate study to emphasis on graduate work. In 1960 the name was changed to the School of Government, Business, and International Affairs.

The School offers undergraduate and graduate programs in various fields of International Affairs, Public Affairs, Business and Economic Statistics, Accounting, and Business Administration. Students in the freshman and sophomore years are registered in the lower division of Columbian College of Arts and Sciences, the liberal arts college of the University. Here they are assigned special advisers to assist them in planning their programs. Only graduate work is offered in Economic Policy, Hospital Administration, Personnel Administration, and Public Administration.

* The Dean and Assistant Dean of the School are members ex officio of all committees.

OBJECTIVES

The School of Government, Business, and International Affairs offers programs to prepare men and women for careers in the conduct of international affairs, as well as programs to equip students for eventual senior administrative responsibility in business and government. The development of mid-career programs for executives has become a further objective of national significance.

The School was reorganized in 1960 in recognition of the growing interdependence of business and government at both the national and international levels. The programs in Business and Public Administration include examination of administrative principles and the quantitative approaches to decision-making common to both business and government. These programs stress the points at which major policy decisions of either business or government must give consideration to related policy decisions of the other. Emphasis is placed upon the fact that management education is not limited to organizational techniques, but is, in its broadest sense, education for management responsibility.

International Affairs is an area of higher education in which programs have been offered by the School of Government, the predecessor of the present School, since its inception. These programs, based on the fundamentals of economics, history, politics, and law, also give recognition to the international impact of American business activity.

ADMISSION

The University accepts both men and women. Students are admitted at the beginning of each semester and summer session.

The right is reserved to refuse admission to any student with an academic record which creates doubt of his ability to succeed in college or who, for any other reason, would not be an acceptable student.

APPLICATION FOR ADMISSION AND READMISSION

Forms for application for admission or readmission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FE 8-0250, extension 344. The application for admission*, with a $10 application fee and a recent, signed photograph, should be returned to the Office of the Director of Admissions.

Application for admission or readmission for degree candidacy, together with all required credentials, should be received by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions to insure consideration. Late applications will be considered only if the application form and all required credentials are received in the Admissions Office no later than two weeks prior to the first day of registration for the semester or session for which application is made. Exceptions may be made under extraordinary circumstances, at the discretion of the Director of Admissions.

Application for admission* to *nondegree status* in the Division of University Students must be received, with a $5 application fee and necessary credentials, no later

* An application for readmission does not require a fee unless it involves transfer to a college, school, or division of the University other than the one in which the applicant was last registered. In this case, a $5 transfer fee is required.

than the Saturday preceding the first day of registration, as stated in the University calendar.

An applicant from a secondary school must send the high school record form provided by the University to his high school principal, with the request that the completed form be mailed directly *to the Office of the Director of Admissions.*

An applicant who has attended one or more institutions of higher learning must request each registrar to mail directly *to the Office of the Director of Admissions* a transcript of his record, *even though credits were not earned.* If high school units are not shown on the college transcript, the applicant should request his high school to submit a transcript to the Office of the Director of Admissions.

ADVANCED STANDING

Credit for Advanced Placement Examinations

Up to 30 semester hours of credit may be granted for college-level courses in an approved secondary school, if substantiated by satisfactory performance in the Advanced Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, N. J.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the courses of study completed by the applicant.

Credit from Higher Institutions

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University. It may be allowed provisionally, and it may be withdrawn for subsequent poor work. Work of low pass grade (*D* or the equivalent) will not be considered for transfer.

The student must be in good standing as to scholarship and conduct. He must be eligible to return to the last previously attended institution in the semester for which he seeks admission to this University.

READMISSION

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded), must apply for readmission in the Office of the Director of Admissions. If he applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of the Director of Admissions from each institution attended. Applications for readmission are considered on the basis of regulations currently effective.

ENTRANCE REQUIREMENTS

Good character and an academic background appropriate for the program of studies contemplated are required.

For the Bachelor's Degrees

Bachelor of Arts in Government.—The satisfactory completion of the *International*

Affairs and *Public Affairs* curriculum in the lower division of Columbian College of Arts and Sciences (see pages 27–28), or the equivalent.

Bachelor of Business Administration.—The satisfactory completion of the *Accounting and Business Administration* or the *Business and Economic Statistics* curriculum in the lower division of Columbian College of Arts and Sciences (see pages 29 and 30), or the equivalent.

For the Master's Degrees

A Bachelor's degree from an accredited college or university is required.

Students admitted to candidacy must have attained a quality-point index of 3.00 (a *B* average) in the relevant undergraduate fields.

Master or Arts in Government

In the field of International Affairs or *Public Affairs.*—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

In the field of Public Administration.—An undergraduate major in a social science or equivalent work experience.

In the field of Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology.

In the field of Economic Policy.—An undergraduate major in economics at this University, or the equivalent.

Master of Business Administration

In the field of Accounting or *Business and Economic Statistics.*—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

In the field of Business Administration.—A Bachelor's degree from an accredited college or university is required. Students with majors in economics or business administration may be able to complete the program in the minimum 30 hours. Applicants who lack necessary undergraduate background are required to make up deficiencies over and above the normal Master of Business Administration program. Those with backgrounds in fields other than economics or business administration are encouraged to pursue graduate work in business administration; but they must expect programs longer than the minimum 30 hours. In the field of hospital administration, consideration in the selection of candidates is given to personal qualifications, aptitude for hospital administration, and practical experience. In the program of automatic data processing appropriate courses in mathematics are required.

In the field of Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology.

For the Doctor's Degree

Doctor of Business Administration.—A Master's degree in Business Administration or a related field, or the equivalent, and proficiency in statistics and accounting to the satisfaction of the Committee on Doctoral Studies are required.

REGISTRATION

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions.

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded), must apply for readmission in the Office of Admissions.

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in this University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration.* Allowance of credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

In Residence Registration

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status by paying the appropriate fee, see page 15. For the purpose of this regulation the summer term will be disregarded.

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

Time and Place of Registration

Registration is conducted in Building C, 2029 G Street NW., during the following periods: *fall semester*, September 20 and 21, 12:00 to 8:00 P.M.; September 22, 10:00 A.M. to 1:00 P.M. *Spring semester*, January 31 and February 1, 12:00 to 8:00 P.M., February 2, 10:00 A.M. to 1:00 P.M.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted, effective September 1, 1962:

Tuition Fees	
Full-time program (15 hours or more): for each semester*	$500.00
Part-time program: for each semester hour*	33.00
For the degree of Doctor of Business Administration:	
For work† leading to and including the general examination	1,100.00
For work leading to and including the final examination	1,100.00

* Payment of tuition for a Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

† This fee does not cover the cost of tuition for elementary courses (numbered 1 to 100).

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

Special Fees

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application fee for room reservation (see page 45)	50.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Admission tests (when required)	6.00–12.00
For Binding Master's Thesis	6.00
For Printing Summary of Doctoral Dissertation	85.00
Graduation fee	25.00
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree at the time of registration for the final semester of study (excluding summer sessions)	10.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program: dropping or adding a course, changing from one section to another within a course, change of status (from auditor to credit status or vice versa), and change in credit hours for a course	2.00
Withdrawal fee, charged in special cases	5.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees")	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements (see page 14). Due and payable on the official days of registration	33.00
For special physical examination	2.00
For each examination to qualify for advanced standing and for each special examination	5.00
English test for foreign students (when required)	5.00
Transcript fee, charged for each transcript of record after the first	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under Health Administration. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are

* Payable at the time of application for transfer or readmission.

paid. Fees for each semester are due and payable in advance at the time of registration.

With the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration. Installment-due notices are mailed. However, nonreceipt of notice is no excuse for failure to meet obligations when due.

A student who fails to meet payments when due, but pays his fees within the following two weeks of the date on which payment is due, is charged a $2 service fee. A student who fails to meet payments within these two weeks after payment is due is automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of $5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the dean of the college, school, or division in which the student is registered. Notification to an instructor is not an acceptable notice (see "Withdrawal", page 21).

In authorized withdrawals and changes in schedule, financial adjustments will be made as follows:

Fall Semester

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of tuition charges.

Spring Semester

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the difference between the

* The University work week is Monday through Friday, inclusive.

charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

A student enrolled in a full-time program, who drops or adds a course and continues to be in a full-time program, will have no financial adjustments of tuition made other than those involving course fees.

In no case will a refund be made of the first third of the total tuition charges. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

A student in chemistry who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a $3 checkout fee. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Students enrolled in the ROTC who fail to turn in uniforms, equipment, and textbooks, on separation from the Corps, are charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

FELLOWSHIPS, GRADUATE SCHOLARSHIPS, AND ASSISTANTSHIPS

The following fellowships, graduate scholarships, and assistantships are available. Unless otherwise specified, applications should be submitted not later than March 1 preceding the period for which the award is to be made. They should be directed to the chairman of the department or the dean of the school concerned and addressed to The George Washington University, Washington 6, D. C.

University Teaching Fellowships.—Assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to $2,000 plus tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Tuition and laboratory fees may not exceed $500. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the chairman of the department of instruction concerned.

* The University work week is Monday through Friday, inclusive.

Graduate Teaching Assistantships.—Open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to $2,000 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Tuition and laboratory fees may not exceed $600. Application should be made to the chairman of the department of instruction concerned.

American Security and Trust Company Fellowship (1960).—A two-year fellowship of $2,000 a year is available to a graduate student in business administration or economics in the School of Government, Business, and International Affairs.

Winfield Scott Blaney Fellowship in International Affairs (1961).—Bequest of Jeannette Blaney Strayer in memory of her father. The income from this fund, up to $1,200, is used to provide fellowships for graduate students in a field of international relations, in the School of Government, Business, and International Affairs.

Scottish Rite Fellowships.—The Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction, U.S.A., offers fellowships each in the amount of $2,200, to graduates of accredited colleges who wish to enroll in the School of Government, Business, and International Affairs, to train for government leadership—federal, state, or local. The territory includes the Orients of Alabama, Alaska, Arizona, Arkansas, California, Colorado, District of Columbia, Florida, Georgia, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wyoming, Panama, Puerto Rico, and the Bodies of Taiwan, Japan, Okinawa, and Guam.

These fellowships are made possible by annual gifts and are available to residents of the respective states or countries, and application therefore should be made to the Sovereign Grand Inspector General of the Supreme Council, 33°, of the Southern Jurisdiction, U.S.A., of the Orient state or country from which the application is to be made. Direct inquiries to Mr. C. M. Farrington, The George Washington University.

Wolcott Foundation Fellowships.—Sponsored by the Wolcott Foundation of High Twelve International and available to graduates of accredited colleges who wish to enroll in the School of Government, Business, and International Affairs for graduate work in International Affairs, Public Administration, Personnel Administration, or Business Administration. Preference is given to students who themselves are affiliated with, or whose parents are affiliated with, High Twelve International or the Masonic Order. The fellowships cover tuition for one calendar year of graduate study in residence. Where need is shown, a living allowance up to $100 a month may be granted. Direct inquiries to Mr. C. M. Farrington, The George Washington University.

SCHOLARSHIPS AND PRIZES

The following scholarships and prizes are limited to students in the School of Government, Business, and International Affairs. The University offers many others which are open to students in this School. A special bulletin containing a complete list and full information may be obtained from the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

Scholarships are awarded for the academic year unless otherwise specified and are

credited in equal parts for each semester. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded.

Scholarship application should be made in writing on or before April first for the following academic year and, unless otherwise specified, should be addressed to the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C. Awards are made during the month of April. All scholarships begin with the fall semester.

American Society of Women Accountants Scholarship (1953).—Established by the District of Columbia Chapter to provide a partial scholarship for a worthy sophomore, junior, senior, or graduate woman majoring in accounting.

Lula M. Shepard Scholarships (1946).—By bequest, two partial scholarships for "worthy Protestant students" wishing to enroll in the International Affairs program of the School of Government, Business, and International Affairs.

Alpha Kappa Psi Prize.—A key, awarded annually by Beta Mu Chapter to the male student who has completed 90 semester hours at this University and attained the highest average grade in economics, business administration, public accounting, public finance, and foreign commerce. The name of the winner and the year of the award is engraved on a plaque in the office of the Dean of the School of Government, Business, and International Affairs.

Wilbur J. Carr Prize.—This prize of $200 was established in 1962 by Edith K. Carr, an Honorary Trustee of the University, in memory of her distinguished husband, who was graduated from the School of Comparative Jurisprudence and Diplomacy in 1899. It will be awarded annually to that man in the graduating class of The George Washington University who has demonstrated outstanding ability in his study of international affairs and who has given evidence of possessing in marked degree the qualities which produce the good citizen and the dedicated public servant.

Ernest Connolloy Memorial Award.—Awarded by the Washington Personnel Association to an outstanding graduating senior in business administration who shows general excellence in studies, demonstrates superiority in one or more courses in personnel administration, and shows qualities of leadership or promise through extra-scholastic activities.

John Henry Cowles Prizes.—A first prize of $100 and a second prize of $75, established by John H. Cowles, Grand Commander of the Supreme Council of Thirty-third Degree (Mother Council of the World) of the Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction of the United States of America. Awarded annually to the two seniors in the School of Government, Business, and International Affairs with the highest academic averages.

Morgan Richardson Goddard.—A memorial established by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C. Awarded to the junior or senior student making the highest average in the following fields: economics, business administration, foreign commerce, and public accounting.

FINANCIAL AID

Student Employment

Graduate and undergraduate student assistantships are available in several departments of the University. Application should be made to the chairman of the department of instruction concerned.

The Placement Office maintains a registry of positions available in many fields of work and refers qualified applicants for consideration.

Loan Funds

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of the University have made available a fund for short-term loans to students to provide for partial payment of tuition. Application should be made three days prior to the dates on which tuition installments are due.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given applicants who express a wish to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than July first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

A list of banks and commercial finance firms offering various types of tuition payment plans is available through the Office of the Treasurer.

For information concerning full- and part-time employment, see "The Placement Office", page 46.

REGULATIONS

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. A student may be dropped from any course for undue absence.

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provision is made for him to make up the work missed.

A student suspended for any cause may not attend classes during the period of suspension.

INDEPENDENT STUDY PLAN

A student of *demonstrated capacity*, with a special interest in the subject matter of a course, may be permitted to undertake study under the personal direction of an instructor, in accordance with the rules of the appropriate department. Credit under

this plan is limited to the specific course credits normally allowed when taken on a class basis.

SCHOLARSHIP REQUIREMENTS

A student who fails to maintain the scholarship requirements of the School of Government, Business, and International Affairs may be dismissed from the University.

Grades

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors. For details of grading system see pages 24–25 and 35.

Examinations

Examinations are scheduled at the end of each semester or at the completion of the course.

Academic Dishonesty

Evidence of dishonesty on the part of any student will result in his suspension by the Dean upon recommendation of the Dean's Council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for all courses in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in computation of the quality-point index.

If a student suspended because of academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the quality-point index.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Permission to withdraw from the University will not be granted a student who does not have a clear financial record. (See "Fees and Financial Regulations", pages 16 and 17.)

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

A student may not withdraw from either the basic course or the advanced course of the Air Force ROTC without the approval of the President of the University.

CHANGES IN PROGRAM OF STUDIES

Changes within a College, School, of Division.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the Dean.

Change from one section to another of the same course may be made with the approval of the Dean and the department concerned.

* The University work week is Monday through Friday, inclusive.

Change from one major subject to another within the same college or school may be made with the approval of the Dean. All requirements of the course of study to which the change is made must be met.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Except in cases of normal progression from the lower division of Columbian College in a regular baccalaureate program, application for transfer must be made to the Director of Admissions on the form provided by his office.

Students wishing to transfer from the Division of University Students to a degree-granting college or school of the University should note that a maximum of 45 semester hours will be accepted in transfer.

Students transferring within the University should note that 30 semester hours, including *at least 12 semester hours* in the major field, must be completed *in residence* in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill.

CREDIT

Credit is given only after registration for a course and satisfactory completion of the required work, or upon the assignment of advanced standing.

On request the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations. A student who takes a course as an auditor may not take the same course later for credit.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirements, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—Application should be filed in the Office of the Registrar at the time of registration for the last semester of the senior or final year. No applications will be accepted after the date stated in the calendar. Students expecting to complete, during the Summer Sessions, requirements for degrees to be awarded at the February Convocation, must apply for graduation as a part of registration for the Summer Sessions.

Residence.—A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return, unless during his absence he maintains "in residence" status by paying the residence fee, see page 15.

The student who has completed tuition requirements, but whose graduation is de-

ferred for any reason must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

Students who complete degree requirements during the Summer Sessions and are cleared for February graduation by the Registrar are not required to register "in residence" for the fall semester.

Graduate Record Examination.—All candidates for Bachelor's degrees are required to take two parts of the Graduate Record Examination (see page 26).

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for a degree, must be presented in its final form to the Dean no later than the date specified in the University calendar. Three complete copies of each are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of theses and dissertations, which are rigidly enforced.

Accepted theses or dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.

Presence at Graduation.—Presence at the graduation exercises is required of the candidate, unless the work for the degree was completed during the summer term or written application for graduation *in absentia* has been approved by the Dean.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

CLASSIFICATION OF STUDENTS

A *junior* is a student who has completed between 64 and 94 hours and filed the declaration of his major, approved by his adviser, in the Office of the Dean.

A *senior* is a student who has completed between 94 and 124 hours, including at least 6 hours of second-group work in his major.

A *master in course* is a student who has satisfactorily completed the work for the Bachelor's degree and filed his approved program of study in the Office of the Dean.

A *doctoral candidate* is a student who has been admitted by the Committee on Doctoral Studies.

THE BACHELOR'S DEGREES

The School offers programs leading to (1) the degree of Bachelor of Arts in Government with majors in International Affairs or Public Affairs and (2) the degree of Bachelor of Business Administration with majors in Accounting, Business Administration, and Business and Economic Statistics.

THE REQUIREMENTS FOR THE DEGREES

Amount of Work

A full-time student not on probation may not ordinarily take more than 15 semester hours. A student employed more than 24 hours a week, who is not on probation, may not take more than 9 semester hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 18 semester hours. A student employed more than 24 hours a week, whose index is 3.50 or higher, may take up to 12 semester hours.

A student who accepts employment after registration or at any time during a semester must report immediately to the Dean, so that his program may be adjusted if necessary.

Exception to these rules will require the approval of the Dean.

Scholarship

In order to graduate, a student must have the following: (1) a general quality-point index of at least 2.00 and (2) an index in his major of at least 2.50. The major includes the required courses and courses taken in the group options.

Grades

The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the dean's council of the college, school, or division concerned. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. A student may not repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement

to this effect must be submitted to the Registrar by the appropriate departmental chairman.

The Quality-Point Index

Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete record in this University.

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not superseded by a proper grade within the allotted time, it is computed as zero quality points. Grades in courses taken at another institution are not considered in computing the quality-point index.

Honors

Dean's Honor List.—The names of students who achieve a quality-point index of 3.50 or higher are placed on the Dean's Honor List for that semester. Appearance on the List will be limited to (1) full-time students registered for a minimum of 12 semester hours and (2) part-time students registered for a minimum of 12 semester hours over a period of two consecutive semesters, which may include the summer term.

With distinction.—A Bachelor's degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded by the Faculty to the recipient of a Bachelor's degree for outstanding achievement in the major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101 and 102 with an academic standing among the upper third of the students enrolled therein; (2) has an accumulative academic average of *B* or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself by demonstrated leadership through participation in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" is authorized to wear a "Distinguished Cadet" badge above the right breast pocket of the uniform. He may submit an application for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate."

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been designated a "Distinguished Air Force ROTC Cadet" and maintained the standards required of a "Distinguished Air Force ROTC Cadet" during the period between designation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for a Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he made application, will be considered for a regular commission in the United States Air Force.

Probation

A student must maintain a quality-point index of at least 2.00, or be placed on probation, where he remains as long as his index is below 2.00.

Suspension

A student whose index is 1.50 or below, or who is placed on probation for a third semester, whether successive or after an interval, is suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University, he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

Residence

A minimum of 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the School of Government, Business, and International Affairs. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

Graduate Record Examination

All candidates for Bachelor's degrees are required to take two parts of the Graduate Record Examination in the University's institutional testing program. The examinations are conducted by the University twice a year: the Fall Testing Session (December 8, 1962) for seniors graduating in February, and the Spring Session (April 6, 1963) for those graduating in June. Students expecting to complete degree requirements during the summer sessions should take the examination in the Spring Session. Dates of the examinations are announced in the *Schedule of Classes*.

Each senior required to take the Graduate Record Examination must register for it in the office of the Dean when he registers for his final regular semester of study (excluding summer sessions). A $10 examination fee is payable at the time of registration.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

Use of Correct English

The use of correct English, oral and written, is required in all courses. Any student whose English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean and to the Committee on the Use of Correct English. The Chairman of the Committee may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed by failure to make up any such deficiency in English to the satisfaction of the Committee and the Dean.

Summer School Credit

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the dean of his college or school. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

Correspondence and Home-study Courses

No credit is given for work done by correspondence or in home-study courses.

Curriculum Requirements

To be recommended by the Faculty for graduation, candidates are required to complete, in addition to the appropriate freshman and sophomore work, a minimum of 60 semester hours during the junior and senior years, as set forth in one of the following curricula.

Examinations for Waiving Curriculum Requirements

A required course may be waived by the satisfactory passing of a waiver examination authorized and prescribed by the department or curriculum adviser concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Request to take the examination should be made to the curriculum adviser and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

BACHELOR OF ARTS IN GOVERNMENT

Prerequisite—Freshman and Sophomore Years

The following curriculum, offered in the lower division of Columbian College of Arts and Sciences, constitutes the first two years of the Bachelor of Arts in Government curricula in International Affairs and Public Affairs:

		Semester Hours
English	English 1 or 1X, 2	6
Foreign Language		12
Mathematics, Science	Biology 1–2*, Chemistry 3–4; Geology 1–2; Mathematics 3, 6; Physics 11, 12; or Statistics 51, 52	6 to 8
Physical Education	Required of full-time day students not in ROTC	4
Social Studies	Economics 1–2; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10	24

* An interdepartmental course offered by the departments of Botany and Zoology.

Elective†	Students interested in Foreign Service include Geography 52	10 to 12
	Total	64

INTERNATIONAL AFFAIRS

Required—Junior and Senior Years

The international affairs program is broad, covering international political relations, international trade and finance, international communications, and regional studies. Its purpose is to equip students, by providing general background and specialized work, for careers in the field of American foreign relations. The diplomatic service of the United States, the several agencies of government with responsibilities in the international field, the international organizations, and American enterprise abroad offer opportunities in this field.

		Semester Hours
Econ 181–82	International Economics	6
Hist 181–82	Diplomatic History of the United States	6
Pol Sc 171	International Politics	3
or Hist 150	European Diplomatic History since 1878	3
Pol Sc 172	International Organization: the United Nations	6
Pol Sc 181–82	International Law	3
Pol Sc 197	Proseminar in International Affairs	6
Foreign Language	Composition and Conversation	3
Geography		15
Group Option	(To be selected from one of the following groups in consultation with adviser)	9
Elective		60
	Total	

All international affairs majors must complete the *required* courses listed above, plus the group option. Group option courses must be selected after consultation with the adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained for such modification of the option selected.

Group I—International Politics

Composed of courses in Political Science, History, and Geography concerned with the study of American diplomatic relations.

Group II—International Economics

Composed of courses in Economics, Business and Public Administration, Geography, and Statistics concerned with the study of American economic, financial, and business relationships with foreign countries.

Group III—International Communications

Composed of courses in Political Science, Psychology, Sociology and Anthropology, and Journalism concerned with the study of international information programs, public opinion, psychological warfare, cultural relations, and public relations. (It is recommended that the student include statistics in his freshman- and sophomore year program.)

Group IV—Area or Regional Studies

Composed of courses in Economics, History, Political Science, and Geography. Integrated programs of study are available in the following regions or areas: Europe; Africa and the Middle East; Asia and the Pacific Area; the Soviet Orbit; and Latin America. Modifications and combinations of these areas may be made if approved by the adviser. The foreign language requirement should be met by a language suitable for study of the region or area selected.

† Credit is not given for courses elected in Physical Education or Secretarial Studies.

PUBLIC AFFAIRS

Required—Junior and Senior Years

The Public Affairs program is a broad, composite curriculum dealing with domestic government and policy.

		Semester Hours
Econ 121	Money and Banking	3
Econ 161–62	Public Finance and Taxation	6
Econ 165	Government Control of Economic Activity	3
Hist 172	Social History of the United States since 1861	
or Hist 173	Representative Americans	
or Hist 176	Political and Constitutional History of the United States since 1861	3
Pol Sc 121–22	The Constitution of the United States	6
Pol Sc 145	Political Parties and Politics	3
Pol Sc 151–52	Public Administration	6
Group Option	(To be selected from one of the following groups in consultation with adviser)	15
Elective		15
	Total	60

All public affairs majors must complete the *required* courses listed above. The group options provide specializations. Modifications and substitutions may be made when appropriate or necessary provided the consent of the adviser is obtained.

Group I—Economics Option		Semester Hours
Econ 101	Economic Analysis	3
Econ 105	Business Cycles	3
Econ 141	Unionism and Collective Bargaining	3
Econ 142	Labor Economics	3
Hist 174	Economic History of the United States	3
	Total	15

Group II—Politics Option		
Hist 175–76	Political and Constitutional History of the United States	6
Pol Sc 111	Introduction to Comparative Government and Politics	3
Pol Sc 118	Political Theory: the Nature and Growth of Political Thought in the West	
or Pol Sc 120	Foundations of American Democracy	3
Pol Sc 146	Political Pressures and Public Reactions	
or Psych 156	Psychology of Propaganda and Public Opinion	3
	Total	15

BACHELOR OF BUSINESS ADMINISTRATION

ACCOUNTING

Programs are offered to meet the needs of accounting students in the following three areas of professional specialization: (1) Managerial Accounting in Business; (2) Federal Financial Management—Accounting and Budgeting; and (3) Public Accounting. Each program consists of 39 semester hours of *required* courses and 21 semester hours in the area of professional specialization.

Prerequisite—Freshman and Sophomore Years

The following two-year curriculum offered in the lower division of Columbian College of Arts and Sciences is required for admission to the School of Government, Business, and International Affairs as a candidate for the degree of Bachelor of Business Administration with a major in accounting.

		Semester Hours
Accounting	Accounting 1–2	6
English	English 1 or 1X, 2, 11	9
Foreign Language		12
Physical Education	Required of full-time day students not in ROTC	4
Social Studies	Economics 1–2; Political Science 1 and 9, 1 and 10, or 9–10	12
Speech	Speech 1	3
Statistics	Statistics 51, 52	6
Elective*		12
	Total	64

REQUIRED—JUNIOR AND SENIOR YEARS

		Semester Hours
Acct 101	Cost Accounting	3
Acct 111	Financial Statement Analysis	3
Acct 121–22	Intermediate Accounting	6
Acct 132	Accounting Theory	3
Acct 161	Income Tax Accounting	3
Acct 171	Auditing	3
Acct 181	Accounting Systems	3
BA 102	Fundamentals of Management	3
BA 131	Business Finance	3
BA 161	Commercial Law: Contracts, Sales, Agency, and Bailments	3
BA 162	Commercial Law: Negotiable Instruments, Property, Mortgages	3
Econ 121	Money and Banking	3
		39
Area of Professional Specialization		21
	Total	60

All accounting majors *must* complete the *required* courses listed above, plus one of the following areas of professional specialization.

Area of Professional Specialization

Managerial Accounting in Business.—Students preparing for careers in managerial accounting in business may specialize in a particular area of accounting, such as systems, cost, budgeting, or tax, or preferably, may concentrate on broadening their background in business administration or in more general fields of knowledge. The Managerial Accounting in Business Program thus provides maximum flexibility for students who wish to combine basic training in accounting with other career interests, either in preparation for general business responsibilities or in preparation for a more specific career in the financial management field.

		Semester Hours
Acct 162	Federal Tax Practice	3
Acct 191	Advanced Accounting	3
Acct 193	Business Budgeting	3
Acct 196	Accounting Policy and Control	9
Elective		3
	Total	21

Federal Financial Management—Accounting and Budgeting.—Students preparing for careers in financial management in the Federal Government may combine basic professional training in accounting with more specialized training in the financial management techniques used in administering the complex affairs of modern-day government. A flexible program can be developed in keeping with the specific career objectives of the individual student by the careful selection of electives.

* Credit is not given for courses elected in Physical Education or Secretarial Studies.

		Semester Hours
Acct 141	Governmental Accounting	3
Acct 144	Federal Accounting	3
Acct 147	Federal Budgeting	3
Elective (to be selected in consultation with the adviser)		12
	Total	21

Public Accounting.—The Public Accounting Program is a concentrated professional curriculum designed to prepare students for a career in public accounting and the Certified Public Accountants examination. It combines the maximum number of professional accounting courses consistent with the broad educational background essential to a successful accounting career in the modern business world.

		Semester Hours
Acct 102	Advanced Cost Accounting	3
Acct 141	Governmental Accounting	3
Acct 162	Federal Tax Practice	3
Acct 172	Auditing Practice	3
Acct 191	Advanced Accounting	3
Acct 198	Professional Accounting Review	3
BA 163	Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts	3
	Total	21

BUSINESS ADMINISTRATION

The program in business administration is designed to provide the broad foundation required for eventual top leadership in either governmental or business administration. Thirty semester hours of substantive courses are required. In addition students take 15 semester hours in one of the group options and 15 hours of electives, which normally are advanced courses in liberal arts subjects.

Prerequisite—Freshman and Sophomore Years

The following two-year curriculum offered in the lower division of Columbian College of Arts and Sciences is required for admission to the School of Government, Business, and International Affairs as a candidate for the degree of Bachelor of Business Administration with a major in business administration.

		Semester Hours
Accounting	Accounting 1–2	6
English	English 1 or 1X, 2, 11	9
Foreign Language		12
Physical Education	Required of full time day students not in ROTC	4
Social Studies	Economics 1–2; Political Science 1 and 9, 1 and 10, or 9–10	12
Speech	Speech 1	3
Statistics	Statistics 51, 52	6
Elective*	Students interested in Foreign Commerce include Geography 51	12
	Total	64

Required—Junior and Senior Years

		Semester Hours
BA 101	Introduction to Business	3
BA 102	Fundamentals of Management	3
BA 105	Personnel Management	3
BA 131	Business Finance	3
BA 141	Principles of Marketing	3
BA 161	Commercial Law: Contracts, Sales, Agency, and Bailments	3

* Credit is not given for courses elected in Physical Education or Secretarial Studies.

BA 162	Commercial Law: Negotiable Instruments, Property, Mortgages	3
BA 198	Case Problems in Management	3
Acct 193	Business Budgeting	3
Econ 121	Money and Banking	3
		30
Group Option (to be selected from one of the following groups)		15
Elective (to be selected in consultation with the adviser)		15
	Total	60

All business administration majors must complete the *required* courses listed above, plus the group option. Selection of group option courses must be made in consultation with the adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained if the student wishes such modification of his option group.

Group I—General Business
Composed of courses in Accounting, Business and Public Administration, Economics, and Statistics.

Group II—Personnel
Composed of courses in Business and Public Administration, Economics, Psychology, Speech, and Statistics.

Group III—Finance
Composed of courses in Accounting, Business and Public Administration, Economics, Political Science, and Statistics.

Group IV—Marketing, Procurement, and Production
Composed of courses in Business and Public Administration, Economics, Geography, and Statistics.

Group V—Controllership
Composed of courses in Accounting, Business and Public Administration, and Economics.

Group VI—Economics
Composed of courses in Economics and Business and Public Administration.

Group VII—Statistics
Composed of courses in Statistics

Group VIII—Transportation and Public Utilities
Composed of courses in Business and Public Administration, Economics, Geography, History, and Statistics.

Group IX—Automatic Data Processing
Composed of courses in Accounting, Business and Public Administration, Economics, Electrical Engineering, Mathematics, and Statistics.

Foreign Commerce.—Business Administration majors who wish to specialize in foreign commerce may request a modification of the above requirements. The modified major excludes some of the above required courses and adds others, such as a third year of foreign language, foreign markets, exporting and importing, economic geography, and other courses relating to overseas trade. Each program must be approved by the adviser.

BUSINESS AND ECONOMIC STATISTICS

The undergraduate program of business and economic statistics, is designed as preparation for business and economic analysis, with 30 semester hours of substantive requirements and 30 semester hours of electives from Accounting, Business Administration, Economics, and Statistics.

Prerequisite—Freshman and Sophomore Years

The following two-year curriculum offered in the lower division of Columbian College of Arts and Sciences is required for admission to the School of Government, Business, and International Affairs as a candidate for the degree of Bachelor of Business Administration with a major in business and economic statistics.

		Semester Hours
Accounting	Accounting 1–2	6
Economics	Economics 1–2	6
English	English 1 or 1X, 2	6
Foreign Language		12
Mathematics	Mathematics 21, 22, 23	9
Physical Education	Required of full-time day students not in ROTC	4
Political Science or Philosophy	Political Science 9–10 Philosophy 51–52	6
Statistics	Statistics 51 or 91, 52	6
Elective*		9
	Total	64

	Required—Junior and Senior Years	Semester Hours
BA 101	Introduction to Business	3
BA 102	Fundamentals of Management	3
BA 131 or 141	Business Finance	
BA 161	Principles of Marketing	3
BA 162	Commercial Law: Contracts, Sales, Agency, Bailments	3
Econ 101–2	Commercial Law: Negotiable Instruments, Property, Mortgages	3
Econ 105	Economic Analysis	6
Stat 111–12	Business Cycles	3
Elective (A)	Business and Economic Statistics I–II	6
Elective (B)	(To be selected from Statistics)	18
		12
	Total	60

THE MASTER'S DEGREES

The School of Government, Business, and International Affairs offers programs leading to (1) the degree of Master of Arts in Government with major fields in International Affairs, Public Affairs, Economic Policy, Public Administration, Personnel Administration; and (2) the degree of Master of Business Administration with major fields in Accounting, Business and Economic Statistics, Business Administration, Hospital Administration, and Personnel Administration.

ADMISSION TO GRADUATE STUDY

A 3.00 average in the undergraduate major is normally required for admission to graduate study. Deficiency in undergraduate preparation may be satisfied by (1) taking specified undergraduate courses and maintaining a 3.00 average in such courses or (2) passing a comprehensive examination in the major field. The comprehensive examination may be taken only with the Dean's approval upon recommendation of the curriculum adviser.

ADMISSION TO CANDIDACY

A student is recognized as a candidate for a Master's degree only when his application for candidacy has been approved.

Language Requirement.—A candidate for the degree of Master of Arts in Govern-

* Credit is not given for courses elected in Physical Education or Secretarial Studies

ment with a major field in International Affairs, Public Affairs, or Economic Policy must show that he has a reading knowledge (certified by the appropriate language department) of at least one modern foreign language, to be approved by the Dean. The language examination should be taken before the student begins the second 15 hours of his work. No student may take the examination after three unsuccessful attempts.

REQUIREMENTS FOR THE DEGREES

Master's degrees are awarded by vote of the Faculty on completion of *a minimum* of 24 semester hours of course work, an acceptable thesis equivalent to 6 semester hours, and the passing of the comprehensive examination. At least 30 hours must be completed at this University. An applicant whose background does not include necessary courses or equivalent experience must undertake a program longer than 30 hours. Many students require 39 hours; longer programs are not uncommon.

The Hospital Administration Program requires 45 semester hours of all students and requires a major report in lieu of a thesis.

Second-group courses (numbered 101–200) may be counted toward the Master's degree up to a maximum of 12 hours, but only when registration for advanced credit has been approved at the beginning of the course by the curriculum adviser. No work counted toward a Bachelor's degree may also be counted toward a Master's degree.

All work for a Master's degree must be completed in three years, unless an extension of time is granted by the Dean. Validation examinations may be required.

In addition to any course examination, the candidate must pass comprehensive written examinations in his major field. These examinations are scheduled two or more times a year (usually in December and in April), and should be taken during the last semester of course registration or shortly after the completion of the prescribed course work. The candidate must consult with his adviser, well in advance, as to the date of his examination and the definition of the subject-matter fields which this examination is to cover. An oral examination on his thesis or major report may also be required.

A student who expects to continue his studies for the degree of Doctor of Philosophy (Graduate Council) or Doctor of Business Administration, after receiving the Master's degree, will be assisted in planning his program so that he may qualify for admission to candidacy for the Doctorate.

Required Courses in Administration

Breadth and background in general administration theory and practice are provided by the following courses, which are *required* of all Master's candidates in the fields of Public Administration, Business Administration, Hospital Administration, and Personnel Administration.

BPA 201 Advanced Administrative Management (3)
BPA 204 Quantitative Factors in Administration (3)
BPA 207 Human Relations in Administration (3)

In addition, each student is normally required to take one of the following courses appropriate to his specific area of concentration:

BA 297 Case Studies in Business Administration (3)
HA 206 Case Studies in Hospital Administration (3)
PA 212 Case Studies in Public Administration (3)

Residence

No credit is granted for work done *in absentia*, i.e., without formal instruction, except for hospital residency and the thesis, which may be completed *in absentia* with the permission of the department, curriculum adviser, or committee concerned.

Scholarship

Grades for graduate work are *E*(excellent), *S*(satisfactory), *U*(unsatisfactory), and *I*(incomplete). A minimum of 6 of the first 30 semester hours of course work completed in the Master's program must be graded *E*.

A Master's candidate who has accumulated more than 6 semester hours of *U* will be automatically suspended.

The Thesis

The student who plans to complete work for a Master's degree in one year should register for the thesis at the beginning of the year; otherwise he should be registered for it not later than the beginning of the final year. The choice of the thesis subject must be approved by the professor in charge and recorded in the Office of the Dean by the date announced in the University calendar. The thesis in its final form must have the approval of the professor in charge and must be presented to the Dean by the student no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year is granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period, the student must reregister and pay tuition as for a repeated course.

MASTER OF ARTS IN GOVERNMENT

Curricula leading to the degree of Master of Arts in Government are available in the fields of International Affairs, Public Affairs, Economic Policy, Public Administration, and Personnel Administration, as described below.

The field of Personnel Administration is described on page 39 and may lead to either the degree of Master of Arts in Government or the degree of Master of Business Administration.

INTERNATIONAL AFFAIRS

Prerequisite: the applicant's undergraduate program must have included background courses corresponding to an undergraduate major in International Affairs at this University.

The program in International Affairs is offered in four fields of specialization: International Economics, International Politics, International Communications, and Regional Studies.

International Economics.—Graduate courses in economics (numbered over 200) in the field of international trade, the balance of payments, international financial policies, and international economic policies form the principal part of this specialization. Graduate courses in economic theory are recommended. Other courses may be included with the consent of the adviser.

International Politics.—Graduate courses in political science and history (numbered

over 200), in international law, international politics, international organization, diplomatic history, and American foreign policy, comprise the principal requirements for this specialization. Related courses may be added with the consent of the adviser.

International Communications.—Graduate courses (numbered over 200) in political science, psychology, sociology and anthropology, and geography with 12 hours (one-half of the course work) in the fields of public opinion, international information, psychological warfare, and communications, and 12 hours (one-half of the course work) in the fields of international politics and area studies. The adviser in all cases must approve the course selections.

Regional Studies.—Graduate courses in economics, political science, history, and geography (numbered over 200) dealing with a geographic region, such as Latin America; Europe; Africa and the Middle East; Asia; the Soviet Orbit; or the Pacific Area, comprise the principal requirements. Other courses of broader scope in economics, history, and political science are recommended as part of the program. The adviser in all cases must approve such selections.

The listing of graduate courses for these fields of specialization is given in the departmental offerings for Economics, History, Political Science, Geography, Psychology, and Sociology and Anthropology.

PUBLIC AFFAIRS

Prerequisite: an undergraduate major in public affairs, economics, history, or political science, depending upon the field of specialization. Any course deficiency in the Public Affairs Curriculum, as stated on page 29 must be made up.

The program in Public Affairs is offered in two fields of specialization: Domestic Economics and Domestic Politics.

Recommended for Domestic Economics: courses in economic development, economic policy, public finance, and national income.

Recommended for Domestic Politics: courses in United States social, constitutional, and political history; comparative government; political theory; legislative organization; jurisprudence; political parties; and public opinion.

ECONOMIC POLICY

Prerequisite: an undergraduate major in economics or the equivalent.

The 30 hours of course work must include Economics 210, 265–66; and the thesis, Economics 299–300.

Recommended: courses in income and employment, national income, business cycles, monetary and fiscal policy, economic theory, and statistics. These courses and others that may be appropriate are to be selected with the consent of the adviser.

PUBLIC ADMINISTRATION

The purpose of the program in Public Administration is to prepare graduates to enter public service in the field of administration and to improve the competence of those already in public employment. The program assumes that effective performance at all levels of administration calls for an understanding of the human factors involved, a knowledge of the nature and institutional characteristics of administration in the public service, and an ability to apply the methods and techniques of management. An understanding of all three elements is provided by bringing together into the program different disciplines, including courses in political science, business and public administration, psychology, economics, accounting, and statistics.

Prerequisite: an undergraduate background in the social sciences or business administration.

The 30 hours of course work must include the *required* courses on page 34 and the thesis, Public Administration 299–300.

Urban Affairs Administration.—The program in Urban Affairs Administration is designed to prepare graduates for useful roles in the increasingly complex metropolitan administrative structure. Stress is placed upon gaining a broad understanding of the nature and structure of the city—particularly that of the super-city as it is developing today—and upon administrative theory.

MASTER OF BUSINESS ADMINISTRATION

Curricula leading to the degree of Master of Business Administration are available in the fields of Accounting, Business and Economic Statistics, Business Administration, Hospital Administration, and Personnel Administration as described below.

The field of Personnel Administration is described on page 39 and may lead to either the degree of Master of Arts in Government or the degree of Master of Business Administration.

ACCOUNTING

The Master's program in accounting is valuable not only to the professional accountant but also to those individuals who are preparing for more responsible positions in business and government or who are interested in the teaching profession. This program is sufficiently flexible to meet individual student objectives.

Prerequisite: a Bachelor's degree from an accredited college or university with a *B* average in the undergraduate major. Students who do not present a satisfactory undergraduate accounting major equal to 30 semester hours, will be required to take background courses in preparation for the graduate program. The Master's program in accounting requires the following courses:

		Semester Hours
Acct 231	Contemporary Accounting Theory	3
Acct 295–96	Seminar in Accounting	6
Acct 299–300	Thesis	6

Of the remaining 15 semester hours, 9 must be in accounting and 6 in related fields selected with the approval of the adviser.

BUSINESS AND ECONOMIC STATISTICS

Prerequisite: an undergraduate major in Business and Economic Statistics, or the equivalent; such work must include a minimum of 24 semester hours of second group courses in statistics and a minimum of 10 semester hours in second-group courses in accounting, business administration, and economics.

This program requires at least 12 semester hours of graduate courses in statistics. The remaining 12 semester hours are to be selected from graduate work offered by the departments of Accounting, Business and Public Administration, Economics, and Statistics with the approval of the adviser.

BUSINESS ADMINISTRATION

This curriculum provides the graduate student with instruction which will help him advance to responsible positions in business. The program is also valuable for many positions in government, particularly those in "business-type" operations.

The Master of Business Administration program is sufficiently flexible to meet the basic requirements of any vocational objective requiring a knowledge of management principles. In addition to the *required* courses, page 34, and other courses in Business Administration, the individual program should be planned with an adviser so as to include graduate courses offered by other departments wherever appropriate. Particular attention should be given the offerings under Public Administration, Economics, Accounting, Statistics, and Psychology.

Students normally will be required to complete a minimum of 24 hours of graduate courses and 6 hours of *Thesis*. Individual programs are planned in consultation with an adviser. Students who do not present satisfactory undergraduate majors will be required to take background courses, which will be selected in accordance with individual qualifications and work experience.

The thesis subject should be selected as early as possible so as to permit effective integration with the course work.

Automatic Data Processing.—This program prepares students for positions in management where data processing methodology and equipment are becoming major factors.

HOSPITAL ADMINISTRATION*

This graduate program is designed to help prepare students who aim for positions of top leadership in hospital administration. Its curriculum is planned to give students an opportunity to acquire the knowledge, attitudes, and skills which will provide a foundation for their growth into capable administrators of hospitals and related institutions.

In view of the specific career objectives stated above, the requirements both in semester hours of course work and in resident study are greater than those of other fields in the Master of Business Administration Program. A minimum of 45 semester hours and a minimum of twenty-one months of study are required.

Work for the degree is divided into two phases. During the first phase a minimum of 36 semester hours of academic courses, adapted in accordance with each student's background needs, must be completed satisfactorily. These courses cover the general and technical background of hospital administration, general administrative theory and practice, and problem solving in the area of management as it relates to general and special hospitals (including mental hospitals), nursing homes, and similar institutions.

The second phase requires at least a full calendar year of on-the-job institutional training under qualified supervision. Students may not enter this phase until they have completed the requirements in phase one. During phase two, each student will be required to complete a major report. This written report will count as part of the 9 semester hours required for this phase. Selected students will take an additional 9 hours covering a full second year of residency. By special permission, additional research and course work may be substituted for a part of the clinical training. Each program is made out for the individual student in accordance with his experience, needs, and aims.

Full-time students should complete both phases for the degree in twenty-one months: part-time students in thirty-six months. Under special circumstances, additional time may be granted. No student will be admitted who does not plan to complete the entire program.

Prerequisite: a Bachelor's degree from an accredited college or university. While a 3.0 (*B*) average in the undergraduate major is expected, considerable weight will be given to personal qualifications, aptitude for hospital administration, and practical experience, in the selection of candidates.

Although students may be accepted with majors in any undergraduate field, a desirable background would include courses in accounting, biology, business administration, economics, psychology, sociology, and statistics. One-semester courses in accounting and statistics *must* be taken prior to admission as a full-time graduate student. Applicants with academic deficiencies may be permitted to enroll as special students subject to the satisfactory completion of prescribed courses beyond the minimum requirements for admission.

In addition to the required courses, see page 34, the following courses *must* be taken:

		Semester Hours
†BPA 268	Management Engineering	3
HA 202	Introduction to Medical Care Administration	3

* Other health care administrtion programs, relating to nursing homes, medical records, and facilities for the aged, are described in more detail on page 61.

† Students who have had this course may substitute another third-group Hospital Administration course, with the approval of the Program Coordinator.

HA 203–4	Hospital Organization and Management I-II	6
HA 205	Hospital Management Procedures	3
HA 207	Hospital Management Analysis	3
HA 209	Hospital Finance and Planning	3
*HA 293–94–95	Hospital Residency I	9
Elective		3

PERSONNEL ADMINISTRATION

This program instructs students in underlying principles and techniques. The program leads to the degree of Master of Arts in Government if elective courses are directed toward Public Administration. It can also lead to the degree of Master of Business Administration if elective emphasis is directed toward Business Administration.

The 30 hours of course work must include the *required* courses on page 34 and the thesis (Business Administration 299–300 or Public Administration 299–300). Additional courses will be selected, upon recommendation of the adviser, from the following:

		Semester Hours
BPA 206	Personnel Management	3
BA 209	Seminar in Personnel Management	3
BA 210	The Personnel Manager	3
PA 212	Case Studies in Public Administration	3
PA 232	Federal Personnel Procedures	3
PA 233	Seminar in Manpower Development and Utilization	3
PA 272	Seminar in Public Personnel Administration	3
Econ 241	Labor Economics	3
Econ 244	Collective Bargaining	3
Psych 244	Seminar: Job Analysis and Evaluation	3
Psych 245	Seminar: Employee Motivation and Morale	3
Psych 246	Seminar: Personnel Measurement Techniques	3

DOCTOR OF BUSINESS ADMINISTRATION

The work for this degree is under the supervision of the Committee on Doctoral Studies of the School of Government, Business, and International Affairs.

An applicant must have the degree of Master of Business Administration, Master of Arts in an approved field, or the equivalent of such degrees, together with acceptable personal qualities and a capacity for creative scholarship. Each applicant must demonstrate his competence in Statistics and Accounting by qualifying examinations.

After admitting an applicant, the Committee on Doctoral Studies, in consultation with the applicant, will designate six fields of study in the broad areas of Business and Public Administration and Economics and appoint an adviser to guide the student in his work in these fields. As part of this work, the student must complete a minimum of 30 semester hours in graduate courses. Additional course work may be prescribed by the adviser.

When the applicant has satisfied his adviser and the Committee of his readiness to take the General Examination in the six fields of study previously designated, the examination will be scheduled.

* The student must register for 9 semester hours of residency at the end of the first phase and before he leaves the University for his residency hospital. Registration for 1963-64 will be held May 24, 1963.

Upon successful completion of the General Examination and approval of the subject of the doctoral dissertation, the student may be admitted to candidacy by the Committee on Doctoral Studies. The candidate's research and the preparation of his dissertation are supervised by a Research Adviser designated by the Committee.

The Dissertation

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary and a copy of the abstract for inclusion in the announcement of the examination. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. The summaries of accepted dissertations will be printed in a numbered issue of the University Bulletin. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

The Final Examination

The Final Examination of the candidate consists of his oral defense of the dissertation. The examination will be given by a committee appointed by the Committee on Doctoral Studies. Upon successful completion of this oral examination the candidate will be approved for the degree of Doctor of Business Administration by the Committee on Doctoral Studies.

SPECIAL PROGRAMS

The Government Management Intern Scholarship Program offers annually fifty scholarships to assist federal agencies in training carefully selected young men and women for administrative leadership in government career service. Each scholarship provides a tuition-free course of 3 hours a semester and appropriate academic credit (up to 6 semester hours) for the successful completion of training assignments required in any agency which has been evaluated by the University.

The Navy Graduate Financial Management Program, sponsored by the Naval Postgraduate School, provides 50 semester hours of work in financial management and related fields for a selected group of Naval and Marine officers. The Master's degree is awarded upon successful completion of this full-year program.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields for a selected group of Air Force officers. Most of the officers receive the Master's degree upon successful completion of this full-year program.

The School of Government, Business, and International Affairs cooperates with the College of General Studies in the Off-Campus programs of that College, particularly in the fields of accounting, business administration, controllership, governmental administration, international affairs, and personnel administration. Special Master's degree programs have been established by the College of General Studies in cooperation with the School of Government, Business, and International Affairs for the students and faculty of the Army War College, Carlisle Barracks, Pennsylvania; the War

College Air University, Maxwell Air Force Base, Montgomery, Alabama; the Industrial College of the Armed Forces, Fort McNair, Washington, D. C.; the National War College, Fort McNair, Washington, D. C.; and the Naval War College, Newport, R. I. These programs lead to the degrees of Master of Arts in International Affairs or Master of Business Administration.

CENTER FOR THE BEHAVIORAL SCIENCES

The Center, administratively related to the School of Government, Business, and International Affairs, was established as an inter-departmental and inter-disciplinary organization for encouraging behavioral science research, projects, and programs. Projects are sponsored and financed by foundations, governmental agencies, private organizations, and individuals.

A Faculty Executive Committee gives University supervision, and a nation-wide Advisory Board provides policy recommendations for long-range planning. Faculty members and students participate in the research activities of the Center for the Behavioral Sciences.

Results of research studies and related projects are reported through a publication program of the Center. A two-week Laboratory utilizing sensitivity training is sponsored annually by the Center and the College of General Studies in cooperation with the National Training Laboratories of the National Education Association.

INSTITUTE FOR SINO-SOVIET STUDIES

The Institute for Sino-Soviet Studies was established to provide for study of vital problems created for the free world by the existence of the Communist Bloc. The study of international communism will be offered in integrated programs dealing with the ideological, political, economic, sociological, and psychological issues characteristic of Communism and communist political systems, especially as manifested by the Soviet Union and Red China.

The Institute aims to promote the interchange of scholarly opinion throughout the free world through an international conference series. The library facilities of the Nation's Capital and the proximity of government combine to make Washington an ideal location for such an educational research activity.

VETERANS EDUCATION

The George Washington University is approved to provide training for those who are eligible under the provisions of Public Laws 634, 190, 550, 16 and 894. The Office of Veterans Education, Building Q, 2029 H Street, NW., operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office concerning the procedure for securing educational benefits before applying to the Veterans Administration for certification.

AIR FORCE RESERVE OFFICERS' TRAINING CORPS

The mission of the Air Force ROTC is to develop in selected students through classroom instruction and leadership training, the qualities essential for advancement to responsible positions as commissioned officers in the United States Air Force.

Course of Study

The program is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

Since many of the academic subjects in which college students are enrolled have a direct relationship to military as well as to civilian careers, some of the liberal arts courses of the University have been substituted for academic courses included in standard Air Force ROTC curricula. Courses have been carefully selected to avoid duplication in instruction and to provide practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral or written expression, and the techniques of problem solving are emphasized throughout the course, both in theory and practice. In addition, orientation flights and field trips to Air Force bases are available to cadets on a voluntary basis.

Twelve semester hours of elective credit* are granted Air Science students as follows:

Freshman year: fall semester, 1 hour; spring semester, 3 hours
Sophomore year: fall semester, 3 hours; spring semester, 1 hour
Junior and senior years: each semester, 1 hour

In the four-year program 16 semester hours of credit for courses offered by other colleges and schools of the University may be substituted for Air Science courses.

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately $500, which is exempt from income tax. During the period of summer training, cadets receive $75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet.

Eligibility Requirements

Enrollment in the Division of Air Science basic course is open to all men students who are at least 14 years of age, physically fit, of good character, and candidates for Bachelor's degrees. Men enrolling in the basic course are required to complete successfully the two-year course as a prerequisite to graduation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

Women students may enroll in the Basic Leadership Laboratory course, which

* The amount of elective credit applicable toward a degree varies with the curriculum concerned.

satisfies the physical education requirement. They may also enroll in the academic portion of the basic course for elective credit, with the approval of the Director of Air Science and the Dean.

A cadet enrolled in the advanced course must successfully complete the junior- and senior-year Air Science curricula and summer training unit as a prerequisite to graduation. Upon graduation he is obligated to accept a commission in the United States Air Force, if tendered. Any cadet who for academic, physical, or other reasons becomes disqualified for a commission is relieved of this obligation. Cadets preparing for pilot training may be required to take 35 hours of flying instruction. This instruction is provided by a Civil Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

Both men and women may enroll in Advanced Air Science courses with the approval of the Director of Air Science and the Dean.

Military Service Delay

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible: (2) the Director of Health Administration has authority to determine the necessity and length of hos-

* A charge for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.
† See Rule (5) for exception.

pitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

THE READING CLINIC

The Reading Clinic, 2018 Eye Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition special reading improvement classes are conducted on the high school and adult level.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests: and the various reading and spelling tests. Results are interpreted and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups with common reading difficulties, $3.25 a lesson. All fees are payable in advance at the Office of the Cashier.

THE TESTING AND COUNSELING CENTER

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

The Center provides special testing services including: diagnostic tests prescribed by the School of Engineering, admissions tests for the University and for other educational institutions, and tests for business and industry.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is $7.50; for students currently enrolled in the University but not as degree candidates, the fee is $30; for graduates of the University, $30; for community clients, $45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains six residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Rooms are leased for the academic year, and a deposit of $50, which is credited toward the fall semester room charge, is required. If notice of withdrawal or cancellation of room reservation is received prior to June 30, $25 of the deposit will be refunded. Room rentals are payable in advance by the semester.

Forms for applications, together with detailed information, may be obtained from the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the residence halls only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to live outside the residence halls except with persons approved by the Director of Activities for Women.

Freshmen girls may live outside the residence halls only with their parents or with immediate relatives with the written approval of their parents.

John Quincy Adams Residence Hall for men provides triple rooms with bath. Rooms rent at $345 a person for the academic year.

John C. Calhoun Residence Hall for men provides double rooms at $380 a person for the academic year.

William H. Crawford Residence Hall for women provides double rooms at $405 a person for the academic year.

Dolly Madison Residence Hall for women provides double rooms at $405 a person for the academic year.

Hattie M. Strong Residence Hall for women provides single rooms at $470 and double rooms at $405 a person for the academic year.

Welling Residence Hall for men provides double rooms at $300 a person for the academic year.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

University Chapel

The University Chapel is maintained as a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling and conference.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers outstanding employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting officers. The services of the Counseling Center are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

INTERNATIONAL HOUSE

International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

STUDENT ACTIVITIES

Directors of Student Activities

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all nonacademic phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

Student Government

Student Council

The University believes in encouraging the development of a sense of civic responsibility in its students by delegating to them such authority in student activities as is consistent with established policy and regulations. To this end, the organization of the University includes the Student Council, which, under the guidance of the Directors of Student Activities, is responsible for the conduct of all student activities. The Student Council is elected annually by the student body.

Committee on Student Life

The Committee on Student Life has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee. This Committee is given authority to approve or disapprove the establishment of any proposed organization on campus.

Eligibility for Student Activities

Any student registered in the University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee, Adams Hall Council, Calhoun Hall Council, Crawford Hall Council, Madison Hall Council, Strong Hall Council, Welling Hall Council, or any publications staff.
2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

The control and administration of all student activities are outlined in a separate bulletin called "Rules and Regulations Governing Student Activities."

Sports

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Intersorority Athletic Board cooperate with the department of Physical Education in conducting the women's intramural and informal extra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

Other sports activities are included in the Sailing Association and the Rowing Club.

Arts

Students may participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III (Modern Dance) and Folk

Dance; Enosinian Debate Society; University Players; University Glee Club; and University Orchestra. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Arts, an annual student art exhibit is presented.

Annual Events

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion in Life Week.—Observed during the week of Thanksgiving, Religion in Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion in Life Week is sponsored by the University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree, the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions explore annually with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members.

The Colonial Cruise.—An afternoon and evening cruise on the Potomac in the late spring. Students, alumni, and faculty picnic, dance, and engage in games and athletic contests.

STUDENT ORGANIZATIONS

Honor Societies

Arnold Air Society.—A national Air Force ROTC society for advanced cadets.

Delphi.—An intersorority society.

Delta Sigma Rho.—A national forensic society.

Gate and Key.—An intrafraternity society.

Mortar Board.—A national society for senior college women, stressing leadership, scholarship, and service.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Pershing Rifles.—A national Air Force ROTC society for basic cadets.

Phi Sigma Tau.—A national philosophy honor society.

Pi Epsilon Delta.—A national drama honorary fraternity.

Pi Gamma Mu.—A national social-science society.

Psi Chi.—A national psychology fraternity.

Sigma Alpha Eta.—A national speech and hearing fraternity.

Professional Organizations and Departmental Clubs

Alpha Kappa Psi (commerce and economics), El Club Español, Enosinian Debating Society, Le Cercle Français, Lester F. Ward Sociological Society, Phi Delta Gamma (graduate), Phi Sigma Tau (philosophy), Russian Club, Sigma Delta Pi (Spanish), Society for the Advancement of Management (student chapter).

Social Fraternities

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Sigma Delta, Sigma Nu, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta.

Social Sororities

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi, Sigma Delta Tau.

Religious Organizations

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

Student Publications

The Cherry Tree (the annual), *The University Hatchet* (weekly newspaper), *The Potomac* (literary magazine), *The Student Handbook*.

Other Organizations

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Calhoun Hall Council, Cheerleaders, Colonial Boosters, Crawford Hall Council, Cultural Center, Democratic Club, Flying Sponsors, Foggy Bottom Sports Car Club, Interfraternity Council, Interlaw Fraternity Council, International Relations Club, International Students' Society, Inter-sorority Athletic Board, Junior Panhellenic Association, Madison Hall Council, Old Men, Republican Club, Senior Panhellenic Association, Strong Hall Council, Student Council, Students for Better Government (Political Party), Student Legal Aid Society, Station WRGW, University Pep Band, Wandering Greeks, Welling Hall Council, Writers' Club.

COURSES OF INSTRUCTION

On the following pages of this Catalogue, under the alphabetically arranged names of the departments of instruction, is *a partial listing* of the courses of instruction offered by the University in the summer of 1962 and in the academic year 1962-63. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

Hours of Instruction

Classes are scheduled in the morning, afternoon, and evening. Evening and daytime sections of the same course are identical, are taught by the same staff of instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the usual four years, a part-time student may complete the requirements and obtain a degree.

Explanation of Course Numbers

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the instructor, and when the completion of additional work has been certified by the instructor.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the instructor to qualified seniors; they are not open to other undergraduates.

Indication of the Amount of Credit

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3–3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING

First Group

1-2 *Introductory Accounting* (3–3) Kennedy and Staff

First half: fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. *First half:* basic principles underlying accounting records, preparation of the work sheet and financial statements, accounting for single proprietorships and partnerships. *Second half:* accounting for corporations and introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 *General Accounting* (3) Kennedy and Staff

Not offered 1962–63. Study of accounting systems and accounting for single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

SECOND GROUP

101 *Cost Accounting* (3) — Eaton

Fall—day and evening; summer 1962. Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; and analysis and interpretation of cost data. Prerequisite: Accounting 1–2.

102 *Advanced Cost Accounting* (3) — Eaton

Spring—evening. Advanced cost accounting theory and problems with emphasis on development and analysis of standard costs, the use of cost data for managerial control, and distribution cost accounting. Prerequisite: Accounting 101 or permission of the instructor.

111 *Financial Statement Analysis* (3) — Kennedy, Steele

Fall—day; spring—evening; summer 1962. Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1–2 or permission of the instructor.

115 *Survey of Accounting* (3) — Disler, Gallagher

Fall—evening; spring—evening; summer 1962. Accounting for single proprietorships and corporations with emphasis on the use of accounting information in the management process; study of theory, terminology, and the analysis and interpretation of accounting data. Not open for credit to Accounting or Business Administration majors.

121–22 *Intermediate Accounting* (3–3) — Gallagher, Simpson

Academic year—day and evening. *First half:* valuation and amortization problems of current assets, long term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

132 *Accounting Theory* (3) — Kennedy

Spring—day. Development of basic accounting principles and concepts with special reference to current thought expressed by the American Institute of Certified Public Accountants and the American Accounting Association. Prerequisite: 6 hours of accounting.

141 *Governmental Accounting* (3) — Lewis

Fall—evening. Problems relating to governmental appropriation accounts, encumbrances, and fund accounting. Emphasis on municipal and state government accounting with an introduction to federal accounting. Prerequisite: Accounting 1–2 or permission of the instructor.

144 *Federal Accounting* (3) — Lewis

Spring—evening. Accounting procedures in the Federal Government, with emphasis on agency level accounts, implementation of accrued expenditure legislation, and accounting support for cost-based budgets. Accounts of the United States Treasury; current concepts of allotment, obligation, and disbursement accounting and reporting. Prerequisite: Accounting 141 or permission of the instructor.

147 *Federal Budgeting* (3) — Lewis

Not offered 1962–63. Budgetary procedures in the Federal Government, with emphasis on agency level budget programming, budget formulation and the techniques for achieving management objectives through the budget process; cost-based budgeting; expenditure programming and accrued expenditure limitations; revenue estimating. Prerequisite: Accounting 144 or extensive experience in federal budgeting.

161 *Income Tax Accounting* (3) — Kurtz

Fall—evening. Problems involved in the federal income taxation of individuals and corporations, differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1–2.

162 *Federal Tax Practice* (3) Kurtz

Spring—evening. Advanced problems of federal tax practice such as the tax treatment of partnerships, estates, trusts, corporate reorganizations, foreign income, and gifts; use of the tax services; assessment, collection, and refund procedures. Prerequisite: Accounting 161 or the permission of the instructor.

171 *Auditing* (3) Eaton

Fall—evening; spring—day. Duties and responsibilities of auditors: principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121–22.

172 *Auditing Practice* (3) Eaton

Spring—evening. Preparation of audit reports, accounting statements to be filed with Securities and Exchange Commission, and current developments of auditing standards and practice. Prerequisite: Accounting 171 or permission of the instructor.

181 *Accounting Systems* (3) Lewis

Fall—evening. Theory and procedure of designing and installing accounting systems for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121–22, and 171, or permission of the instructor.

191 *Advanced Accounting* (3) Kurtz, Simpson

Fall—evening; summer 1962. Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121–22.

193 *Business Budgeting* (3) Lewis, Buckler

Fall—day; spring—evening; summer 1962. Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1–2.

196 *Accounting Policy and Control* (3) Lewis

Not offered 1962–63. Accounting decision-making and analytical techniques, emphasizing the financial policy and operational role of the accountant and his contribution to enterprise management. Readings, cases, and problems form a basis for class discussions. Prerequisites: Accounting 101, 111, 161, and 171, or permission of the instructor.

198 *Professional Accounting Review* (3) Lewis

Spring—evening. Review and coordination of the principles and techniques developed in the accounting curriculum, in preparation for general practice in the field of accountancy and for professional accounting examinations. Prerequisite: Accounting 101, 141, 162, 171, and 191, or permission of the instructor.

Third Group

211–12 *Managerial Accounting* (3–3) Kennedy, Higginbotham

First half: not offered 1962–63. *Second half:* fall—evening. *First half:* analysis of the accounting system with special reference to the use of financial and operating records and accounting reports as tools of management; a study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1–2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite to Accounting 212: Accounting 211 or permission of the instructor.

215 *Survey of Managerial Accounting* (3) Higginbotham

Spring—evening. Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process. Prerequisite: Accounting 1–2, 3, or 115.

231 *Contemporary Accounting Theory* (3) Kurtz, Higginbotham
Spring—evening; summer 1962. Advanced accounting principles and concepts and recent theories concerned with the valuation and amortization of assets and determination of income. Admission by permission of the instructor.

246 *Governmental Accounting and Budgeting Problems* (3)
Not offered 1962–63. Advanced principles and practices in federal accounting relationship to general policy and administration. Prerequisite: Accounting 144 or permission of the instructor.

275 *Internal Control and Auditing* (3) Kurtz
Summer 1962. Internal accounting controls; review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitableness. Emphasis on the use of internal control and auditing as an aid to management. Prerequisite: Accounting 171 or permission of the instructor.

295–96 *Seminar in Accounting* (3–3) Kennedy
Academic year—evening. Selected accounting research topics and problems; individual oral and written reports. Admission by permission of the instructor.

297–98 *Accounting Reading and Research* (3–3) Kennedy and Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) Kennedy and Staff
Academic year—as arranged; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the accounting courses listed below for students enrolled in the following special programs: Navy Graduate Financial Management Program, Air Force Advanced Management Program, and Engineering Administration.

3 *General Accounting* (3)

115 *Survey of Accounting* (3)

204 *Survey of Cost Accounting* (2)

211–12 *Managerial Accounting* (3–3)

215 *Survey of Managerial Accounting* (3)

278 *Survey of Internal Control and Auditing* (3)

293 *Budget Preparation and Administration* (3)

BOTANY

BIOLOGY*

1-2 *Introductory Biology** (4–4) The Staff
An interdepartmental course. Lecture (2 hours), laboratory (4 hours).
Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.
Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.
This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses

* Beginning with the academic year 1962–63, Biology 1-2 *Introductory Biology* (4-4) replaces Botany 1-2 *General Botany* (3-3) and Zoology 1-2 *Introduction to Zoology* (4-4). Botany 1-2 and Zoology 1-2 will be offered for the last time in the summer of 1962.

in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

BUSINESS AND PUBLIC ADMINISTRATION

Third Group

201 *Advanced Administrative Management* (3) Eastin, Ericson, Gibbs
(Replaces Business Administration 201 and Public Administration 210)
Fall—day and evening; spring—evening. An advanced course in administration emphasizing principles and practices common to administrative units of all kinds.

204 *Quantitative Factors in Administration* (3) ———
Fall and spring—evening. Developments in quantitative methods of administration. Morrow

205 *Seminar in Communication and Executive Action* (3)
(Formerly Public Administration 242)
Spring—evening. Seminar in the communications processes. Research and analysis, identification of factors relating to receptivity; the dynamics of communication. Torpey

206 *Personnel Management* (3)
(Formerly Public Administration 231)
Fall—evening. Basic principles; structure and organization of personnel offices; responsibilities; interagency relationships; personnel staffing, training, and work measurement. ———, Brown

207–8 *Human Relations in Administration* (3–3) ———
(Replaces Business Administration 275–76, and Public Administration 241)
Academic year—evening. Individual, group, intergroup, and other human behavior and development; application of social science research to administration. Practical applications will be emphasized. Ericson

262 *Contemporary Administrative Theory and Practice* (3)
(Formerly Public Administration 262)
Spring—evening. Current theories and trends in management with particular attention to the behavioral sciences communications and applicability of research. Clewlow

268 *Management Engineering* (3)
(Formerly Business Administration 268)
Fall—day and evening; spring—evening. Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys including the study of work measurements, work simplification management audits, and other management improvement programs. Clayton

287 *Relation of Government to Business* (3)
(Formerly Business Administration 278 and 287)
Spring—evening. Activities of government in their relation to business management in such areas as labor relations, wages, production, and prices. Trend and change in economic activity and its bearing upon government policy.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the following business and public administration courses for students enrolled in the Navy Graduate Financial Management Program and the Air Force Advanced Management Program.

206 *Personnel Management* (3)

207–8 *Human Relations in Administration* (3–3)

268 *Management Engineering* (3)

BUSINESS ADMINISTRATION

Second Group

101 *Introduction to Business* (3) ———

(Formerly Business Organization and Combination)

Fall—day and evening; spring—day; summer 1962. The business environment; its effects upon the decision making process.

102 *Fundamentals of Management* (3) Ericson, Page

Fall—day and evening; spring—day and evening; summer 1962. Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.

105 *Personnel Management* (3) Eastin, Stonesifer

Fall—day; spring—evening; summer 1962. Industrial personnel and manpower programs, organizations and policy in personnel activities.

106 *Problems in Personnel Management* (3) Eastin, Stonesifer

Spring—day. Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.

107 *Labor-Management Contracts* (3) Sommers, Larson

Fall—day; spring—evening. Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.

109 *Office Management* (3) ———

Fall—evening; spring—evening. Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.

113 *Real Estate* (3) Doubleday

Fall—evening. Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.

121 *Risk Management* (3) Doubleday

Spring—evening. A general course in underlying principles of property, life, marine, and casualty insurance, and the function of insurance in the economic life of a business or individual.

122 *Life Insurance and Estate Planning* (3) Doubleday

Spring—evening. Life insurance contracts, their use in providing protection and estate development.

131 *Business Finance* (3) Clayton, Page

Fall—day; spring—day and evening. Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1–2.

136 *Credit Management* (3) ———

Spring—evening. Types and sources of credit information, credit relationships from the standpoint of the commercial bank and the commercial business enterprise. Prerequisite: Accounting 1–2.

138 *Investments* (3) Dockeray, Shaffner

Spring—evening; summer 1962. Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1–2, Business Administration 131.

141 *Principles of Marketing* (3) Prestwich
Fall—evening; spring—day; summer 1962. An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1–2.

142 *Marketing Management Problems* (3) Prestwich
Spring—day. Practical problems of retailers, wholesalers, and manufacturers considered through the use of cases and text material; fundamental considerations in marketing decisions and the nature of the problem-solving process. Prerequisite: Business Administration 141.

143 *Marketing Research* (3) Prestwich
Fall—day. Principles and practices of marketing research with particular emphasis upon basic methods and techniques, sources and interpretation of data, and presentation of results.

145 *Sales Management* (3) Eastin
Spring—evening. Organization of the sales department, sales planning and forecasting, quotas, territories, performance standards, and analysis and control of distribution costs. Prerequisite: Business Administration 141.

147 *Advertising* (3) Idelson
Fall—evening. Advertising as a function of marketing and merchandising; uses and limitations of advertising as a tool of management; fundamentals involved in getting a finished advertisement before potential customers; evaluation, criticism, and control of advertising.

150 *Procurement and Materials Management* (3) Prestwich
Spring—evening. Purchasing organization, procedures, and policies; market relationships; selection of merchandise and sources of supply; procurement information and records; evaluation of procurement practices in industry and government.

153 *Principles of Personal Selling* (3) Prestwich
Summer 1962. Basic principles that underlie personal selling and the practical application of these principles. Emphasis is given to the human factor. Career opportunities and the role of selling in our economy are also considered.

158 *Traffic Management* (3) Kaye
Spring—evening. Organization and records of traffic department, routing of shipments, services by carriers, rates and charges, relation of shipper to transportation agencies.

161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3) Berns, Collins, McClure
Fall—day and evening.

162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3) Berns, Collins, Murphy
Spring—day and evening.

163 *Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts* (3) Murphy
Fall—evening.

171 *Principles of Transportation* (3) Clayton
Fall—evening. Impact of transport on society; development, economic characteristics, services, rates, and regulation of the various modes of domestic intercity transportation.

172 *Public Utilities* (3) Clayton
Not offered 1962–63. Legal and economic meaning of the public utility concept; development, services, economic characteristics, ratemaking, and regulation of the various utility industries, with particular emphasis on electric, gas, telephone, and urban transit industries.

173 *Commercial Motor Transportation* (3) Clayton
Not offered 1962–63. Organization, management, services, economic characteristics, rates and regulation of motor transport firms; highways and highway financing considered from the point of view of both producers and users of the services.

174 *Commercial Air Transportation* (3) Clayton
Spring—evening. Organization, management, services, economic characteristics, rates, and regulation of air transport firms; policies and activities of the government in the development, promotion, and control of air transport.

175 *Introduction to Foreign Trade* (3) Kaye
Fall—evening. Terminology, trade usages and practices, conditions essential to successful trading, economic bases of international trade, obstacles to trade, tariffs, impact of governmental controls on private trade. Prerequisite: Economics 1–2.

176 *Exporting and Importing* (3) Kaye
Not offered 1962–63. Policy and operating problems of foreign trade, financing, documentation, packing and transportation of shipments, ocean marine insurance, and U. S. Customs procedure and formalities.

178 *Foreign Markets* (3) Ogdon
Spring—evening. Pattern of world trade by countries and commodities, methods of preparing market surveys, selected regional market analyses. Prerequisite: Economics 1–2.

181 *Manufacturing Production* (3) Page
Spring—evening. Basic principles and methods of manufacturing production. Manufacturing facilities, plant and equipment. Illustrations selected from various process and fabrication industries.

191 *Business Reports and Analyses* (3)
Fall—evening. Sources of management information, array and analysis of data, interpretation and presentation of the findings.

193 *Management Communication* (3) Morrow
Fall—evening; spring—day. A survey course in the problems of communication; written communication; style and format; oral communication: oral briefing and presentation; group leadership; rapid reading; completed staff work; and related subjects.

195 *Controllership* (3)
Fall—evening. The duties, responsibilities, and place of the controller in a business organization; relations of controller to other departments and regulatory bodies; and the controller's relation to price setting and inventories, depreciation policies, internal auditing, expense control and budgeting; and financial reports to management, stockholders, and employees. Prerequisite: Accounting 1–2. Open to seniors.

197 *Introduction to Business Policy* (3)
Not offered 1962–63. Significance of business policies in management; formulation of policies; relation of various organizational levels to policy making; some significant policies, including case problems.

198 *Case Problems in Management* (3) Eastin, Page
Fall—day and evening; spring—day and evening. Principals and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.

Third Group

201 *Advanced Management* (3)
Summer 1962. An advanced course in management emphasizing principles of management in relation to business enterprise.

209 *Seminar in Personnel Management* (3) Eastin
Fall—evening. Discussion of industrial personnel and manpower management, and research in advanced problems.

210 *The Personnel Manager* (3) Jessup

Spring—evening. The job of the personnel manager and his place in the organization; relations of the personnel manager to other executives; the personnel manager's policy role, and his relations with the chief executive. Key problems of the senior personnel executive.

213 *Urban Land Management* (3) Woodruff

Spring—evening. Background course for the developing curriculum in city planning. The course traces the forces that lie behind investment decisions which in turn determine the development of cities.

218 *Introduction to Data Processing* (3) Doubleday

Fall—evening; spring—evening. A survey of modern data processing systems with emphasis on the management problems associated with the installation and use of such systems.

219–20 *Data Processing: Mechanics and Applications* (3–3) Alexander, Glaser

First half: spring—evening; second half: fall—evening. Characteristics of major computer systems; relation to their selection and application to administrative processes. Feasibility studies. Relationship of data processing and quantitative methods of management. Case studies. Prerequisite: Business Administration 218, Business and Public Administration 206.

227 *Linear Programming* (3)

Fall—evening. Introduction to the vocabulary and methodology of management science through the study of linear programming techniques. Case studies.

228 *Introduction to Operations Research for Management* (3)

Spring—evening. Operations research as an approach to the solution of management problems. Emphasis is on the relevance and limitations of operations research. Practical applications are examined.

231 *Corporate Financial Problems* (3) Dockeray, Houston

Fall—evening. Financial practice in promotion, consolidation, and mergers; capital structure adjustments; and reorganization.

232 *Seminar in Business Finance* (3) Dockeray, Houston

Spring—evening; summer of 1962. Research in advanced financial problems.

237 *Investment Analysis* (3) Dockeray, Shaffner

Fall—evening. An advanced course in the applications of investment principles and analytical techniques to the selection of investments. Prerequisite: Business Administration 138.

238 *Seminar in Investments* (3) Dockeray, Shaffner

Not offered 1962–63. Research in investment problems, techniques of selection and the management of various types of funds. Prerequisite: Business Administration 138.

241–42 *Seminar in Marketing* (3–3) Johnson, Prestwich

Academic year—evening. An advanced course in marketing, emphasizing special and current problems in the field. (Business Administration 241 is not a prerequisite for Business Administration 242.)

250 *Contract Administration* (3) Lazure

Fall—evening. The management of government contracts with private suppliers.

251 *Seminar in Retail Management* (3) Prestwich

Not offered 1962–63. Research in retailing practices, with emphasis on trends, new developments, and current problems.

255–56 *Seminar in Foreign Trade* (3) Ogdon

Not offered 1962–63. Research, analysis, and discussion of foreign trade institutions, public and private.

273–74 *Readings in Business* (3–3) — The Staff
Academic year—as arranged. Advanced readings in the fields of finance, marketing, and personnel management. Admission by permission of the instructor.

286 *Management in the Armed Forces* (3) — Jessup
Fall—evening. Special problems of military organization and management; applicability of business management techniques to the armed forces.

288 *Executive Leadership* (3) — Krieger
Fall—evening. Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and public administration; review of the literature, significant research findings, and practical illustrations.

291 *Seminar in Business Management* (3) — Ericson, Page
Fall—evening; spring—evening. Research on various phases of management as practice in American industry.

293–94 *Business Research* (3–3) — The Staff
Summer 1962.

296 *Seminar in Controllership* (3)
Spring—evening. Research on advanced problems of the controller in all types of business organization and the Federal Government.

297 *Case Studies in Business Administration* (3) — Jessup
Fall and spring—evening. Problems of management are analyzed with the view of developing a practical solution; cases are used to show the problems of personnel in marketing, industrial management, finance, etc.

299–300 *Thesis* (3–3) — Dockeray and Staff
Academic year—evening; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the following business administration courses for students enrolled in the following special programs: Navy Graduate Financial Management Program, Air Force Advanced Management Program, and Engineering Administration.

107 *Labor-Management Contracts* (3) (Summer 1962)
235 *Financial Management* (3)
241 *Seminar in Marketing* (3)
253 *Procurement and Distribution* (3)
261 *Seminar in Advanced Management* (3)
263–64 *Business Organization and Management* (3–3)
268 *Management Engineering* (3) (Summer 1962)
269 *Readings and Conferences in Controllership* (2 or 3) (Summer 1962)
275 *Human Relations in Business* (3) (Summer 1962)
284 *Readings and Conferences in Management* (2)
290 *Research Seminar in Management* (3)
295 *Research Seminar in Controllership* (3)
296 *Seminar in Controllership* (3)

HOSPITAL ADMINISTRATION

Third Group

202 *Introduction to Medical Care Administration* (3) Griffiths
Lecture and discussion (2 hours), laboratory (2 hours). Fall—day and evening. Survey of organizations and activities involved in the maintenance of community health, national public health, hospital bodies, communicable diseases, preventive medicine, medical terminology, biostatistics, and environmental sanitation.

203–4 *Hospital Organization and Management I-II* (3–3) Gintzig
Lecture and discussion (2 hours), laboratory (2 hours). Academic year—day and evening. The history and current character of institutional medical care. Organizational functions and structure of various kinds of hospitals, including psychiatric, homes for aged, nursing homes, group clinics, and others related to health care administration. The laboratory is conducted by guest faculty. Prerequisite to Hospital Administration 204: Hospital Administration 203.

205 *Hospital Management Procedures* (3) Gintzig
Lecture and discussion—(2 hours), laboratory (2 hours). Fall—day and evening. A survey of hospital law; a study of hospital forms, procedures, and systems; hospital programs pertaining to disaster relief, safety, fire prevention; personnel, purchasing, and volunteer services; and the operational peculiarities of hospital departments. Prerequisite: Hospital Administration 203.

206 *Case Studies in Hospital Administration* (3) Gibbs
Spring—day and evening. A discussion of general ideas about administration as applied to practical cases. Emphasis is placed on policy making, planning, and controlling in hospitals. Prerequisite: Business and Public Administration 201 and Hospital Administration 203.

207 *Hospital Management Analysis* (3) Gintzig
Lecture (2 hours), laboratory (2 hours). Spring—day and evening. Methods of collecting, analyzing, reporting, and using information that can be made available to administrators of hospitals and other medical care institutions. One day each week is spent in a medical care institution. This time is devoted to an investigation on which written and oral reports are based. Prerequisite: Business and Public Administration 268 and Hospital Administration 203, 205.

209 *Hospital Finance and Planning* (3) Griffiths
Lecture (2 hours), laboratory (2 hours). Spring—day and evening. Medical economics to include sources of hospital income; fund raising drives; methods of procuring, using, budgeting, and accounting for hospital funds; pre-payment plans, impact on community of the cost of medical care. Regional and specific aspects of hospital planning, designing, constructing, equipping, and supplying. Prerequisite: Hospital Administration 202, 203.

285–86 *Readings in Medical Care Administration* (3–3) The Staff
Academic year—as arranged. Advanced studies in various aspects of hospital, nursing home, and other medical care administration and management. Admission by permission of the Coordinator.

293-94–95 *Hospital Residency I* (3–3–3) Gibbs
The twelve-month residency, beginning June 1 or July 1 of each year, has four major objectives: work experience under a qualified preceptor; periodic seminars with University staff; periodic written progress reports of work accomplished; and a final written report of a major investigation. (Other courses may be substituted for Hospital Administration 294–95 as appropriate.)

296–97–98 *Hospital Residency II* (3–3–3) Gibbs
For selected students who take a second year of residency. The Staff

299–300 *Thesis* (3–3)

Courses Offered in Special Program

In addition to the regular courses announced above, the University offers the following hospital administration courses for students enrolled in the Health Care Administration program.

107 *Medical Background Terminology** (3) The Staff
Lecture (3 hours), laboratory (2 hours). A basic course in medical background information, disease classification, and terminology.

108 *Medical Records Processing** (3) The Staff
Lecture (3 hours), laboratory (2 hours). Detailed consideration of methods of processing, preserving, and indexing medical records.

109 *The Medical Records Department** (3) The Staff
Lecture (3 hours), laboratory (2 hours). A study of the Medical Records Department in the hospital. Its characteristics and function.

110 *Preparation and Auditing of Medical Records** (3) The Staff
Lecture (3 hours), laboratory (2 hours). The origin, development, and evolution of the medical record.

111 *Statistical Development and Analysis** (3) The Staff
Lecture (3 hours), laboratory (2 hours). Development and analysis of statistical data required by the hospital for medical record purposes.

112–13–14 *Medical Records Internship** (3–3–3) The Staff
Work projects in appropriate hospitals under qualified preceptor and with faculty supervision.

150–51 *Survey of Medical Care Organization and Procedures* (3–3) Griffiths
Discussion and lecture (2 hours), laboratory (2 hours). A survey course for students in other fields or from medical care organizations, who wish an over-all knowledge of organization and procedures used in hospitals, nursing homes, and similar organizations. This is a two semester sequence. Students not wishing to take the courses for credit need not take the laboratory but are expected to attend and take part in the discussion and lecture sessions. Not open to majors in Hospital Administration.

160 *Medical and Nursing Care for Nursing Homes* (3) The Staff
A survey of the medical and nursing procedures designed for administrators of nursing homes and facilities for the aged.

161 *Business Procedures for Nursing Homes* (3) The Staff
Business procedures with special application to nursing homes and homes for the aged.

162–63 *Readings in Nursing Home Administration* (3–3) The Staff
Advanced studies in selected aspects of administration and care of nursing homes and homes for the aged.

PUBLIC ADMINISTRATION

Third Group

211 *Problems of Governmental Organization* (3) _____
Fall—evening; summer 1962. Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships.

212 *Case Studies in Public Administration* (3) _____
Spring—evening; summer 1962. Analysis and discussion of problems in public management, approached by the group using primarily the case method.

* Part of a sequence. Primarily for nondegree students from other countries; but may be offered for academic credit by special arrangement with the Coordinator of the Programs in Hospital Administration. Ordinarily the program offered twice each year is an accelerated six-month program beginning in February and September—or by arrangement at any time.

213 *Administration in Government* (3) Brown

Fall—evening; spring—evening. Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

215 *Seminar in Comparative Administrative Systems* (3)

Fall—evening. Examination and analysis of the administrative systems of the major foreign governments with particular attention to practices applicable to administration in the United States.

221–22 *Staff Functions in Government* (3–3) Sommers

Academic year—evening. Designed primarily to provide an understanding of the nature, use, and problems of the staff functions as tools of management. Survey of such staff areas as personnel, budgeting, controllership, procurement, property management, the agency lawyer, security, public relations and information, planning, research, the secretariat, management engineering, auditing, accounting, and administrative services.

225–26 *Internship in the Administrative Processes* (3–3) Sommers

Academic year—as arranged. This course is open only to persons selected by government agencies for participation in approved intern programs.

232 *Federal Personnel Procedures* (3) Torpey

Spring—evening; summer 1962. Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.

233 *Seminar in Manpower Development and Utilization* (3) Sommers

Fall—evening. Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.

237 *Intermediate Management and Supervision* (3) Eastin

Spring—evening. The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.

243 *Local Government Law** (2) Mallison

Spring—evening; summer 1962. The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development.

251 *Governmental Budgeting* (3)

Fall—evening; spring—evening; summer 1962. The role of budgeting in management; the principles and practices of budgetary formulation and administration.

252 *Seminar in Planning and Programming* (3) Jacobus

Fall—evening. Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.

254 *Controllership in the Federal Services* (3) Krieger

Spring—evening. Function of the controller in federal agencies; special problems analyzed; comparison of the controller function in government and business.

259 *Government Procurement and Property Management* (3)

Not offered 1962–63. Principles and problems of government procurement; accounting and inventory; storage; development of specifications; property management.

260 *Seminar in Policy Formulation and Administration* (3) Jacobus

Fall—evening. Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.

* Same as Law 349.

261 *Public Opinion and the Administrator* (3) Stromsem
Fall—evening. Theories, techniques, and methods of working with the public; the use of interest groups in developing governmental programs; evaluating public relations programs; the importance of timing; use of public opinion measurement techniques.

271 *Reading and Conference Course in Public Management and Administration* (3) Brown
Fall—evening. The purpose of this course is to provide advanced students with directed reading in specific areas of public management and administration.

272 *Seminar in Public Personnel Administration* (3) The Staff
Spring—as arranged. The purpose of this course is to provide advanced students with directed reading in specific areas of public personnel administration.

297 *Seminar in Public Administration* (3) Brown and Staff
Summer 1962. Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships.

299–300 *Thesis* (3–3) The Staff
Academic year—evening; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers the following public administration courses for students enrolled in the Air Force Advanced Management Program and in Engineering Administration.

213 *Administration in Government* (3)

251 *Governmental Budgeting* (3) (Summer 1962)

260 *Seminar in Policy Formulation and Administration* (3)

CHEMISTRY

3–4 *Fundamentals of Physical Science* (4–4) Schmidt, Ethier
A year course; credit is not given for the first half until the second half is completed. Lecture (3 hours), laboratory (3 hours). Academic year—day. Introduction to methods and achievements of physical science, covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, $11 a semester.

ECONOMICS

First Group

1–2 *Principles of Economics** (3–3) Skinner and Staff
Lecture (2 hours), recitation (1 hour). *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—evening; spring—day and evening; summer 1962. Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

* Economics 1–2 is prerequisite to all other courses in Economics.

Second Group

101–2 *Economic Analysis* (3–3) The Staff
First half: fall—day and evening; spring—evening; summer 1962. *Second half:* spring —day and evening. Analysis of demand, supply, and commodity pricing; theory of national income determination; pricing of productive services; welfare economics. Economics 101 is prerequisite to Economics 102.

104 *History of Economic Thought* (3) Burns
Spring—day. History of the major schools of economic thought; influence of changing problems on the development of economic theory.

105 *Business Cycles* (3) Kendrick
Fall—evening. Description and analysis of the facts of economic instability, survey of recent business cycle theory, forecasting, and consideration of counter-cyclical policies.

121 *Money and Banking* (3)
Fall—day and evening; spring—evening; summer 1962. Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.

123 *Monetary Theory and Policy* (3)
Spring—day. Principal contemporary theories, background of recent monetary policy.

133 *The Economy of the Soviet Union* (3)
Not offered 1962–63. Development and main features of the economic life of the Soviet Union (See History 145–46 and Geography 196).

141 *Unionism and Collective Bargaining* (3) Holland
Fall—evening. The development and characteristics of American unionism and collective bargaining as economic and social institutions, appraisal of economic and social aspects, public policies and controls.

142 *Labor Economics* (3) Holland
Spring—evening. Characteristics of the American labor force, operations of labor markets, wage theories and practices, impact of collective bargaining, causes and characteristics of unemployment, public policies and programs.

161–62 *Public Finance and Taxation* (3–3)
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. General survey of government expenditures; sources and methods of taxation; economic effects of expenditures, taxes, and of government debt policies. Watson

165 *Government Control of Economic Activity* (3)
Fall—day. Changing role of government in promoting and regulating economic activity, types and spheres of control. Schmidt

181–82 *International Economics* (3–3) Survey of
Academic year—day and evening; summer 1962—Economics 181 (3). world economics, theories of international trade, analysis of international economic problems and the international organizations.

185–86 *Economic History and Problems of Latin America* (3–3)
Academic year—evening. Evolution of the economies of Latin America with particular emphasis on present structures and problems, considered in the regional, country, and sub-region contexts. Economics 185, special attention to Middle America; Economics 186, special attention to South America. Skinner

198 *Proseminar in Economics* (3)
Fall—as arranged; spring—as arranged. Comprehensive survey of economics. Prerequisite: Economics 101–2 and 121.

THIRD GROUP

201–2 *History and Literature of Economic Thought* (3–3) Burns
Academic year—evening. Critical analysis and interpretation of the development and the literature of economic thought, origins, and problems, of the major types of theory, and their relation to present problems and policies.

203–4 *Contemporary Economic Theory* (3–3) Watson
Academic year—evening. The contributions of Marshall, Chamberlin, Robinson, Hicks, and others.

205 *Theory of Employment and Income* (3) Kendrick
Fall—evening. Determinants of the level of employment and income. Keynesian and classical systems contrasted, and recent literature on the subject.

206 *Business Cycle Analysis* (3) Kendrick
Spring—evening. Empirical analysis of American business cycles; evaluation of the methodology and findings of the National Bureau of Economic Research. Statistical tests of theories of the business cycle.

208 *The National Income* (3) Kendrick
Spring—evening. The theory of economic aggregates; measurement and policy aspects of national income.

210 *Seminar in Economics* (3) Skinner
Fall and spring—evening. Methodology of economics, integration of economic theories, methods of research. Open only to students who have completed fifteen hours of graduate work in economics.

212 *Seminar in Price Theory* (3) Watson
Fall—evening. Advanced topics in the theory of relative prices. Prerequisite: Economics 203–4 or the equivalent.

213 *Economic Thought in the Twentieth Century* (3) Burns
Summer 1962. Continuation of Economics 201–2. The principal trends in economic thought during the present century.

215–16 *Mathematical Economics* (3–3) Solomon
Academic year—evening. Introduction to the uses of mathematics in economic theory.

217–18 *Survey of Economics* (3–3) _____
Academic year—evening. Survey of economic analysis and policy. Not open to graduate students in economics or economic policy.

219 *Managerial Economics* (3) Watson
Summer 1962. Analysis of price, production, and inventory policies of business firms.

221–22 *Monetary Theory* (3–3) _____
Academic year—evening. Contemporary monetary theories.

223–24 *Monetary Policy and Central Banking* (3–3) Young
Academic year—evening. The money system in its relation to national income: monetary policies of the Federal Reserve and other central banking systems.

231–32 *Quantitative Economics* (3–3) Solomon
Academic year—evening. Selected topics in quantitative economics.

241 *Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Fall—evening. An accelerated introductory course in labor economics primarily for graduate students in Personnel Administration.

244 *Problems in Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Spring—evening. Concentrated study of selected economic, social, and legal aspects of labor relations and labor economics.

246 *Foreign Labor Movements* (3) Holland
Spring—evening. Labor in the economic, social, and political structures of selected foreign countries. Contrasts and comparisons with the United States.

247 *Labor Relations in the Federal Service** (3)
Fall—evening.

251 *Theories of Economic Development* (3) Schmidt
Fall—evening; summer 1962. Growth and change in economic activity, capital accumulation, innovations in technology and business organization.

253 *Productivity Analysis* (3) Kendrick
1963–64 and alternate years. Concepts and measures of productivity; relations to economic growth and to structural changes in the American economy.

261–62 *Public Finance and Fiscal Policy* (3–3) Colm
Academic year—evening. Special problems in contemporary public finance and fiscal policy.

263–64 *Theory of Public Finance* (3–3)
Academic year—evening. Criteria for the allocation of government expenditures, principles of taxation, fiscal policy for stable growth.

265–66 *Theory of Economic Policy* (3–3) Watson
Academic year—evening. The nature, forms, methods, and objectives of economic policy; the relation of economic theory to economic policy.

267 *Economic Organization of the Communist Orbit* (3) Heymann
Fall—evening. Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. (See also History 145–46, 247, and Geography 196.)

281–82 *International Economics* (3–3) Schmidt
Academic year—evening. The modern theories of international economics, the variables determining the balance of payments, techniques to obtain balance of payments equilibrium.

284 *United States Foreign Economic Policy* (3) Schmidt
Not offered 1962–63. Analysis of foreign aid program; international, commercial, and monetary policy of the United States; United States and international economic organization.

285–86 *Economic Development of Latin America* (3–3) Sammons
Academic year—evening. Current policies and programs, capital formation, public and private; foreign loans and investment; social and technological preconditions of investment.

287–88 *Latin America: Trade and Commodity Policy* (3–3)
Not offered 1962–63. Tariffs and exchange control systems, bilateral and general commercial agreements, terms of trade. Schmidt

290 *Seminar in International Economics* (3)
Spring—evening. Advanced topics in international economics. Prerequisite: Economics 281–82 or the equivalent. The Staff

299–300 *Thesis* (3–3)
Academic year—as arranged; summer 1962. Admission by permission of the Instructor.

* An interdepartmental course offered by the departments of Economics and Law.

ENGINEERING

CIVIL ENGINEERING

165 ***Engineering Analysis and Planning*** (3) — The Staff

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Mathematical analysis, planning, and economics of engineering problems and projects including modern computational methods. Prerequisite: senior standing in Civil Engineering.

166 ***Transportation Engineering*** (3) — The Staff

Time to be arranged. Planning and systems analysis of transportation networks. Prerequisite: Civil Engineering 165.

ELECTRICAL ENGINEERING

201 ***General Network Analysis*** (3) — Sawitz

Spring—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, elements of network synthesis.

231 ***Digital Circuitry and Systems*** (3) — Wiggins

Fall—day. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits.

232 ***Digital Techniques*** (3) — Rotolo

Spring—day. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog to digital techniques, wiring diagrams.

233 ***Digital Systems*** (3) — Cunningham

Fall—evening. The programmed system; system design of digital computers, special-purpose digital computers, reliability, data-processing techniques, analog-to-digital and digital-to-analog techniques.

234 ***Automata and Self-organizing Systems*** (3) — Grisamore

Spring—evening. Effectively computable functions and Turing machines, digital computational methods in Boolean algebra, combinational circuits and their analysis, recursion circuits and their analysis, reliability of automata, networks of automata, artificial intelligence.

ENGLISH

A ***English for Foreign Students*** (3) — Allee and Staff

Fall—day and evening; spring—day and evening; summer 1962. A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B ***English for Foreign Students*** (3) — Allee and Staff

Fall—evening; spring—day and evening. For second-semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

1 ***English Composition**** (3) — Moore and Staff

Fall—day and evening; spring—day and evening; summer 1962. Review of grammar, exercises in composition, readings.

* See footnote on page 68.

1X *English Composition** (3) — Moore and Staff

Fall—day and evening; spring—day and evening; summer 1962. An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is $115 (the regular fee of $30 a semester hour, plus an additional fee of $25).

2 *English Composition** (3) — Moore and Staff

Fall—day and evening; spring—day and evening; summer 1962. For second-semester freshmen not following the Columbian College of Arts and Sciences sequence. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X.

11 *The Writing of Reports* (3) — Turner and Staff

Fall—day and evening; spring—day and evening; summer 1962. Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X, and 2 or 4.

GEOGRAPHY

First Group

51 *Introduction to Geography* (3) — The Staff

Fall—day; spring—evening; summer 1962. A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

52 *World Regions* (3) — The Staff

Fall—evening; spring—day; summer 1962. The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.

Second Group

124 *Land Capabilities* (3)

1963–64 and alternate years. Evaluation of land capabilities based on analysis of locational, physical, economic, and social land characteristics. Principles of site analysis and best use. Systems of measurement of area potential.

125 *Transportation Complexes* (3)

1963–64 and alternate years. A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.

126 *World Economies* (3) — Davis

1962–63 and alternate years: fall—day. Description and comparison of differing regional economies—pastoral, agricultural, industrial; patterns of world distribution.

127 *World Population and Settlement* (3)

1962–63 and alternate years: spring—day. Population composition, structures, and distribution; characteristic world settlement patterns in terms of population organization. Assessment of factors contributing to population pressures, explosions and migration. Urban and rural settlement patterns and trends.

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* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course. Those who are inadequately prepared are assigned to English 1X.

English 1 or 1X is prerequisite to all other courses in English. English 2 is the second half of the six-hour composition course requirement.

133 *Regional Industrial Structures* (3)
1962–63 and alternate years: fall—day. The nature of the industrial complex, types and distribution of industry, principles of industrial and economic development planning.

134 *Location of Industry* (3)
1962–63 and alternate years: spring—day. Structure and development of the major world industries, industrial location requirements, principles of industrial equilibrium.

137 *Industrial Planning for Underdeveloped Areas* (3)
Summer 1962. The appraisal of industrial development potentials in non-industrial areas; the preparation and implementation of industrial development plans; peculiar problems of industrial development in traditional societies; the role of industrialized countries, with particular emphasis on United States responsibilities.

141–42 *Urban Settlement* (3–3)
1963–64 and alternate years. Location, functions, and forms of cities; urban-rural relationships; the urban hierarchy; urban problems and the history of their development; the city of the future.

145 *World Cultural Geography* (3) Campbell
Fall—day. A study of differences in national character structures; modal behavior patterns and personality traits typical of various cultures; difficulties these differences present in interpersonal relations and intercultural communications.

146 *World Political Geography* (3) Campbell
Spring—day. Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.

173–74 *City Planning: Theory and Practice* (3–3)
Academic year—evening. Theories of city functions and structures; evaluation of urban activities, value systems; analysis of contemporary urban problems; optimum designs for future cities; theory and techniques of planning; action techniques; implementation of plans.

181 *United States** (3)
Not offered 1962–63.

183 *Western Europe** (3)
1962–63 and alternate years: fall—day.

184 *The Mediterranean** (3)
1962–63 and alternate years: spring—day.

185 *Africa** (3)
Offered 1963–64.

186 *The Middle East** (3)
Offered 1963–64.

191 *Latin America** (3)
1963–64 and alternate years.

194 *Communist China** (3)
Spring—day. Davis

195 *Eastern and Southeastern Asia** (3)
Not offered 1962–63.

* Regional survey. No prerequisites. For students particularly interested in the study of specific regions regional courses in the departments of Economics, History, and Political Science are strongly recommended, for example: Economics 185 86, *Economic History and Problems of Latin America;* History 164, *South America since Independence;* and Political Science 177, *Recent Trends in Latin American Politics and Government*

196 *The Soviet Union** (3)
Fall—day.

197 *The Pacific** (3)
Not offered 1962–63.

198 *Australia** (3)
Not offered 1962–63.

THIRD GROUP†

205–6 *Area Data Collection and Analysis* (3–3)
A year course: credit is not given for the first half until the second half is completed. Lecture (1 hour), laboratory and field (3 hours). 1963–64 and alternate years. Sources of regional information; methods and systems of data collection; quantitative and qualitative methods of analysis; systems of synthesis.

211–12 *Reading Course in Economic Geography* (3–3)
Not offered 1962–63. The development of economic geography as a systematic approach to regional analysis, the literature of economic geography, research methods.

233–34 *Seminar: Regional and Urban Planning* (3–3) ————, Campbell
A year course: credit is not given for the first half until the second half is completed. Academic year—evening. Analysis of the planning function, major problems confronting the planner, contemporary status of planning—its areas of success and failure.

241–42 *Seminar: Place and Culture* (3–3)
1963–64 and alternate years. A study of the culture traits which characterize various ethnic groups and differentiate people-place associations.

251–52 *Seminar: World Problem Areas* (3–3)
Summer 1962—Geography 251 (3). A study of those parts of the world which have become matters of international concern, whether because of their political or social instability, unsound economic development, or aggressive tendencies. An evaluation of the complex of factors which have created the "problems".

GEOLOGY

1–2 *Introductory Geology* (3–3) The Staff
Academic year: lecture (2 hours), laboratory and field trip (2 hours)—day. A survey course covering the principles of geology. *First half:* physical geology—materials of the earth's crust, geologic processes. *Second half:* historical geology—geological periods, evolution of life on earth. Laboratory fee, $6 a semester.

GERMANIC LANGUAGES AND LITERATURES

1–2 *First-year German* (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. The essentials of German grammar; translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

* See footnote on page 69.
† Senior major or graduate status is required in all third-group courses.

3–4 *Second-year German* (3–3) **The Staff**
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Selections from modern German prose; continuation and review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: German 1–2 or two years of high school German.

9–10 *German Conversation and Composition* (3–3) **Osterle**
Academic year—day. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

47 *Beginning German for Reading Examination Candidates* (0) **The Staff**
Fall—evening; spring—evening; summer 1962. Specifically for graduate students with little or no German, who are preparing for reading examinations. No academic credit. Tuition fee, $90.

49 *German Readings for Nonmajor Students* (3) **The Staff**
Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or 47, or the equivalent.

51–52 *Introduction to German Literature* (3–3) **Osterle**
Academic year—evening. Prerequisite: German 4 or the equivalent.

HISTORY

First Group

39–40 *The Development of European Civilization* (3–3) **Kayser, Herber**
Academic year—day and evening; summer 1962. Primarily for freshmen. *First half:* the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half:* from 1715 to the present.

71–72 *The Development of the Civilization of the United States* (3–3) **Haskett, Hill**
Academic year—day and evening; summer 1962. Primarily for sophomores. *First half:* the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half:* from 1865 to the present.

Second Group*

109–10 *Ancient History* (3–3) **Kayser**
Academic year—day. The political, social, and intellectual aspects will be considered. *First half:* the ancient Near East and Greece. *Second half:* Rome.

111–12 *Medieval History* (3–3) **Kayser**
Not offered 1962–63. The political, social, and intellectual aspects will be considered. *First half:* from the 4th to the 12th century. *Second half:* from the 13th through the 16th century.

130 *Nationalism* (3) **Kayser**
Summer 1962. The historical evolution of modern nationalism.

131–32 *History of Germany* (3–3) **Herber**
Academic year—day. The political, social, and cultural development of the German people. *First half:* from the Reformation to 1871. *Second half:* from 1871 to the present.

* History 39–40 is prerequisite to courses 109 through 152 and 190 through 196; History 71–72, to courses 170 through 184; either History 39–40 or 71–72, to courses 161 through 166.

141–42 *History of France* (3–3) Herber
Not offered 1962–63. A survey of the political, social, and cultural history of France. *First half:* from earliest times to 1815. *Second half:* from 1815 to the present.

143 *History of Old Russia* (3) Thompson
Not offered 1962–63. The Slavic and Eurasian roots of Russian society and politics over a thousand-year period, 800–1800.

145–46 *History of Modern Russia* (3–3) Thompson
Academic year—day. The rise and fall of the revolutionary cycle. *First half:* Tsarist Russia in the Golden Age, 1800–1917. *Second half:* Soviet Russia and the politics of empire, since 1917.

147 *Economic History of Europe* (3) Gray
Not offered 1962–63. A survey from ancient times to the present day.

148 *Oversea Expansion of Europe* (3)
Not offered 1962–63. International rivalries and the impact of European civilization in Africa and the Pacific basin since 1500, with emphasis on the 19th and 20th centuries.

149–50 *European Diplomatic History* (3–3) Davison
First half: 1963–64 and alternate years. *Second half:* spring—day and evening; summer 1962. Background of the European state system and of diplomatic practices and relations since the Congress of Vienna, with emphasis on the policies and actions of the great powers and their statesmen. *First half:* to 1878. *Second half:* since 1878.

151–52 *English History* (3–3) Kenny
Academic year—day. A general survey of the development of political, social, and economic institutions of lasting significance in the English speaking world. *First half:* to 1689. *Second half:* since 1689.

161 *Ancient Americans* (3) Davis
1962–63 and alternate years: fall—day. A study of the Maya, Aztec, Inca, and other early civilizations of North and South America.

162 *Iberian Background of Latin America* (3) Davis
Alternate spring and summer terms: spring—day; summer 1962. History of Spain and Portugal, with emphasis on developments leading to the rise and decline of the Spanish and Portuguese empires.

163 *Colonial Latin America* (3) Davis
Fall—evening. Political, economic, social, and institutional developments in Spanish and Portuguese America from the conquest through the wars of independence.

164 *South America since Independence* (3) Davis
Alternate spring and and summer terms: spring—evening; summer 1962. Development of the independent South American states in the 19th and 20th centuries.

166 *Mexico and the Caribbean since Independence* (3) Davis
Alternate spring and summer terms: summer 1963; spring 1964. A survey of the republics of Mexico, Central America, and the Caribbean islands.

170 *American Colonial History* (3) Haskett
Spring—evening. The settlement of the British colonies, the development of provincial institutions, and the emergence of an American civilization in the 17th and 18th centuries.

171–72 *Social History of the United States* (3–3) Gray
Academic year—evening; summer 1962—History 172 (3). Daily life, institutions, intellectual and artistic achievements of the Agrarian Era, 1607–1861; and the Urban-Industrial Era, 1861 to the present time.

173 *Representative Americans* (3) Gray
Spring—day; summer 1962. A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform.

174 *Economic History of the United States* (3) Gray
Fall—day. Main trends in the development of American agriculture, industry, and trade since 1607, with their Old World backgrounds and in their world setting.

175–76 *Political and Constitutional History of the United States* (3–3) Haskett
Academic year—day; summer 1962—History 175 (3). *First half:* to the eve of the Civil War. *Second half:* the Civil War to 1940.

177 *The South* (3) Gray
Not offered 1962–63. Rise of the plantation system and slavery; the intersectional conflict; and the problems and progress of the New South.

178 *The West* (3)
Not offered 1962–63. The role of the frontier in American history.

181–82 *Diplomatic History of the United States* (3–3) Merriman, Hill
Academic year—day and evening; summer 1962—History 181 (3). Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. *First half:* to 1898. *Second half:* since 1898.

183 *Oversea Expansion of the United States* (3) Merriman
Spring—day. The political, economic, social, and cultural life of our outlying possessions.

184 *Canada and the United States* (3) Merriman
Fall—day. The historical background and main trends in the relationship of the two English-speaking peoples of North America.

190 *History of India* (3) Thompson
Not offered 1962–63. The civilization of India and her neighbors from the beginnings to independence.

191–92 *Current History* (1–1)
Not offered 1962–63. Contemporary events in their world setting.

193 *History of the Near East* (3) Davison
1962–63 and alternate years: fall 1962—day. The Byzantine, Arab, Persian, and Islamic backgrounds of Near Eastern history; the rise and decline of the Ottoman Empire; the action of European powers in the area; and the Ottoman breakup into the Turkish Republic and other successor states.

195–96 *History of the Far East* (3–3) Thompson
First half: not offered 1962–63. *Second half:* spring—day. *First half:* the civilization of China and Japan from the beginnings to 1600. *Second half:* the modern Far East under the impact of the West since 1600.

197–98 *Proseminar in Latin American Civilization* (3–3) Davis, Robb, Sammons
Academic year—as arranged. Reading course for coordination and review. Open only to majors in Latin American Civilization.

199–200 *Proseminar: Readings for the History Major* (3–3) Thompson
Academic year—evening. Limited to majors in History. Readings and discussions on main trends in the history of Western civilization, including representative selections from the classics of historical literature.

THIRD GROUP*

211–12 *Reading Course in Medieval History* (3–3)
Not offered 1962–63. Primarily for graduate students.

* Approval of the instructor is required for registration in each third-group course.

241–42 *Seminar in Modern European History* (3–3) Herber
Academic year—evening.

243 *Reading Course in Modern European History* (3) Davison
Fall—as arranged. Primarily for graduate students.

246 *Seminar in Eurasian History* (3) Thompson
Spring—evening.

247 *Reading Course in Russian History* (3) Thompson
Fall—evening. Primarily for graduate students.

249 *Seminar in European Diplomatic History* (3) Davison
Fall—day.

251–52 *Seminar in English History* (3–3) Kenny
Academic year—afternoon.

261–62 *Seminar in Latin American History* (3–3) Davis
1963–64 and alternate years.

271–72 *Seminar in the Social History of the United States* (3–3) Gray
Academic year—evening.

273–74 *Reading Course in American Economic and Social History* (3–3) Gray
Academic year—as arranged. Primarily for graduate students.

275–76 *Seminar in American Political and Constitutional History* (3–3) Haskett
Academic year—evening.

277–78 *Reading Course in American Political and Constitutional History* (3–3) Haskett
First half: 1962–63 and alternate years—fall as arranged. *Second half:* 1963–64 and alternate years—fall as arranged. Primarily for graduate students.

281–82 *Seminar in the Diplomatic History of the United States* (3–3) Merriman
Academic year—day.

285–86 *Reading Course in American Diplomatic History* (3–3) Merriman
Academic year—evening. Primarily for graduate students.

291–92 *Seminar* (3–3) The Staff
Academic year—as arranged; summer 1962—History 291 (3). Prerequisite: approval of the Department.

294 *Seminar in the History of the Modern Near East* (3) Davison
Spring—evening.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962. Required of all candidates for the Master's degree specializing in history.

MATHEMATICS

First Group*

3 *College Algebra* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

* No first-group course in mathematics is available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.

6 *Plane Trigonometry* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

9 *General Mathematics I* (3) The Staff
Fall—day; spring—evening; summer 1962 (offered as Mathematics 2). For those students in the School of Education or others electing Mathematics 9 and 10 as a terminal sequence in mathematics. Propositional logic and truth values; the number system, number bases, arithmetical computation; algebraic functions; topics from plane geometry. Prerequisite: two years of high school mathematics. Not open to students who have had former Mathematics 2.

10 *General Mathematics II* (3) The Staff
Spring—day. An introduction to matrices and vector spaces; non-Euclidean geometry; introduction to concepts of the calculus. Prerequisite: Mathematics 9 or former 2.

21 *Calculus I* (3) The Staff
Fall—day and evening; spring—day and evening. Elementary concepts of analytic geometry. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite: Mathematics 3 and 6; or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or the equivalent.

22 *Calculus II* (3) The Staff
Spring—day and evening. Differentiation and integration of transcendental functions and applications; conics; parametric equations; techniques of integration. Prerequisite: Mathematics 21.

23 *Calculus III* (3) The Staff
Spring—evening. Vector concepts; improper integrals; solid geometry; partial differentiation and applications. Prerequisite: Mathematics 22.

24 *Calculus IV* (3) The Staff
Offered 1963–64. Multiple integration with application; infinite series; differential equations. Prerequisite: Mathematics 23.

27 *Calculus I and II* (6) The Staff
The equivalent of Mathematics 21 and 22.
Fall—day and evening; spring—day.

28 *Calculus III and IV* (6) The Staff
The equivalent of Mathematics 23 and 24.
Spring—day.

29 *Calculus I* (3) The Staff
(This course is being offered for the last time summer 1962.)
Summer 1962. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

30 *Calculus II* (3) The Staff
(This course is being offered for the last time fall semester 1962–63.)
Fall—day and evening; summer 1962. Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.

31 *Calculus III* (3) The Staff
(This course is being offered for the last time spring semester 1962–63.)
Fall—day and evening; spring—day and evening; summer 1962. Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor).

PHILOSOPHY

51–52 *Introduction to Philosophy* (3–3) The Staff
Academic year—day and evening; summer 1962—Philosophy 51 (3). A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.

PHYSICAL EDUCATION

1–2 *Freshman Physical Education* (1–1) The Staff
Academic year—day. Locker and towel fee, $4.50 a semester.

11–12 *Sophomore Physical Education* (1–1) The Staff
Academic year—day. Locker and towel fee, $4.50 a semester.

PHYSICS

11 *Introductory Physics* (3) Koehl and Staff
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; spring—day and evening; summer 1962. An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, $11.

12 *Introductory Physics* (3) Koehl and Staff
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Spring—day and evening; summer 1962. Mechanics, wave-motion, and sound. Prerequisite: Physics 11. Material fee, $11.

13 *Introductory Physics* (3) The Staff
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; summer 1962. Elementary electricity and magnetism. Prerequisite: Physics 11. Material fee, $11.

POLITICAL SCIENCE

First Group

1 *Introduction to Government (3)** The Staff
Fall—day; spring—evening; summer 1962. Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

9–10 *Government of the United States** (3–3) The Staff
First half: fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening. *First half:* structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.

SECOND GROUP*

104 *State and Local Governments* (3) LeBlanc
Spring—day. State, municipal, and other local governmental forms, operations, and problems, with attention to policy formulation and administration, and to the forces of practical politics.

105 *The Governmental Process of the District of Columbia* (3) LeBlanc
Not offered 1962–63. Legal structure and political problems of the District of Columbia including restrictions on home rule, Congressional relations, and group politics.

107 *Problems in Modern Political Thought* (3) Kraus
Summer 1962. Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.

111 *Introduction to Comparative Government and Politics* (3) Kraus
Fall—day; summer 1962. Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.

112 *Introduction to Comparative Government and Politics* (3) Kraus
Spring—day. Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.

113 *Political Problems of the British Commonwealth of Nations* (3) Kraus
Not offered 1962–63. From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states in Asia and Africa.

117–18 *Political Theory: the Nature and Growth of Political Thought in the West* (3–3) Kraus
Academic year—evening. *First half:* from Classical Antiquity to the Middle Ages; the forging of the western political tradition. *Second half:* from the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, and resistance; liberalism, democracy, and conservatism.

119–20 *Foundations of American Democracy* (3–3) Brewer
1962–63 and alternate years: academic year—day.

121–22 *The Constitution of the United States* (3–3) West
Academic year—evening. Judicial power of federal courts in constitutional interpretation. *First half:* emphasis on separation of powers, federal-state relationships, and taxation. *Second half:* emphasis on constitutional protection of civil rights.

125 *Legislative Organization* (3) Riddick
1963–64 and alternate years. A study of Congress: constitutional aspects, legal analysis of make-up, and political organization. Political and parliamentary procedures used in the preparation and enactment of legislation. Not open to students who have credit for former Political Science 124.

141 *The Development of Legal Institutions* (3) Brewer
1963–64 and alternate years. Introduction to historical jurisprudence: primary attention to the origins of the Roman Law of Continental Europe and of the Anglo-Saxon Common Law.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

145 *Political Parties and Politics* (3) LeBlanc
Fall—evening; summer 1962. Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress.

146 *Political Pressures and Public Reactions* (3) Ludden
Spring—evening. Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.

151–52 *Public Administration* (3–3) LeBlanc
First half: fall—day; summer 1962. *Second half:* not offered 1962–63. Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.

157–58 *Current Problems in Domestic Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary issues in internal American politics with discussion of problems and policies.

166 *Field Work in Government* (3) LeBlanc
Fall—as arranged; spring—as arranged. Practical training in the operation of the Federal Government, based on experience through assignment to selected government offices. Students will have an opportunity to observe and participate in government in the Washington area. Open only to students in the Public Affairs curriculum, School of Government, Business, and International Affairs.

171 *International Politics* (3) Ludden, Nimer
Fall—day and evening; summer 1962. Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.

172 *International Organization: the United Nations* (3) Ludden
Spring—day and evening; summer 1962. Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations.

177 *Recent Trends in Latin American Politics and Government* (3) Davis
Fall—day. Types of government, recent developments, and current political conditions in each of the twenty Latin American republics.

178 *International Politics in the Western Hemisphere* (3) Davis
Spring—day. Political relations of the American Republics in the 19th and 20th centuries, the development of Pan Americanism and the Organization of American States.

181–82 *International Law* (3–3) Brewer
Academic year—day and evening; summer 1962—Political Science 181 (3). Survey of the public law of nations with emphasis on the law of peace. Neutrality and the so-called law of war receive attention in the second semester.

187–88 *Current Problems in International Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary international issues with discussion of problems and policies.

191 *Politics of the Middle East* (3) Nimer
Fall—day. Domestic and international politics of Turkey, Iran, Israel, and the Eastern Arab States and Principalities. Special attention to the specifically regional aspect of the foreign policies of these countries.

192 *Politics of North and Central Africa* (3) Nimer
Spring—day. Domestic and international politics of the Western Arab States, Ethiopia, Somalia, Liberia, and the newly independent states of former British, French, and Belgian Africa. Special attention to the specifically regional aspect of the foreign policies of these countries.

194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3) ———

Spring—evening. Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.

197 *Proseminar in International Affairs* (3) Nimer

Fall—evening; spring—day; summer 1962. Reading and discussion course for coordination and review. Primarily for seniors in the International Affairs major.

THIRD GROUP

205–6 *The Federal Executive* (3–3) R. C. Bain

Academic year—evening. *First half:* nomination and election of the U. S. President, his constitutional and political powers; the cabinet and the Executive Office of the President; the relation of the President to the executive and legislative branches of the government. *Second half:* the practical politics of the presidency, presidential policy leadership and control, the President as party head and as moulder of public opinion.

209–10 *Seminar: the Federal Government of the United States* (3–3) ———

Academic year—evening. Advanced research emphasizing legislative problems of Congress and relations of Congress with the Administration.

212 *Seminar: Comparative Government and Politics* (3) Kraus

Spring—evening. Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem. Attention will be directed to questions of method.

213 *Readings in Comparative Government and Politics* (3) Kraus

Fall—evening; summer 1962. Readings and group discussions on methodological questions, comparative political and administrative institutions with attention to legislatures, the changing role of the executive, political parties, constitutional and totalitarian approaches to public management and public service, the role of the military, etc.

217 *Seminar: Topics in Political Theory* (3) Kraus

Fall—evening. Research and discussion on problems of modern political and constitutional theory, theoretical aspects of representative government, democracy, socialism, and totalitarianism. Each semester is devoted to a separately announced topic, such as socialism and communism, theories of resistance and revolution, problems of democratic theory.

220 *Reading Course in Political Theory* (3) Kraus

Spring—evening. Readings and group discussions, principally on modern political and constitutional theory since the 17th and 18th centuries.

221–22 *Seminar: The Constitution of the United States* (3–3) West

1962–63 and alternate years: academic year—evening. Selected topics in the development of the law of the Constitution. Primary attention will be given to the development of "due process of law" in the courts.

235 *Metropolitan Problems* (3) H. M. Bain

Fall—evening. Growth of American cities and changing land use patterns in relation to internal transportation systems. The respective roles of the private automobile and of public transportation. The problems of financing and administering public transportation systems under public and private ownership.

245–46 *The American Political Process: Political Parties and Interest Groups* (3–3) LeBlanc

Academic year—evening. *First half:* readings and group discussions on the nature and functions of political parties and the role and techniques of political interest groups. *Second half:* seminar on selected topics of American politics requiring the use of basic research materials.

271–72 *Problems in International Politics and Organization* (3–3) Ludden
Academic year—day. A seminar to develop techniques of research in recent international affairs and to examine developments in international politics and organizations.

273 *Public Opinion and Foreign Policy* (3) Ludden
Fall—evening. Development, organization, and operation of international information programs by major world powers. Public opinion in the United States influencing the formation and conduct of foreign policy.

274 *Methods and Objectives of Foreign Policy* (3)
Spring—evening. Examination of the objectives of foreign policies of the major powers, with attention to political, economic, and military methods used to pursue these objectives.

277 *Seminar: Latin American Government* (3) Davis
Fall—evening; summer 1962. Analysis of the political structures of selected Latin American republics. Two comparable governments studied each year.

278 *Seminar: Latin American Political Philosophy* (3) Davis
Spring—evening. Research in political personalities and philosophies of 19th and 20th century Latin America.

279 *Reading Course in International Affairs* (3)
Fall—evening; summer 1962. Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization.

281–82 *Seminar: International Law and Relations* (3–3) Brewer
First half: fall—evening; summer 1962. *Second half:* not offered 1962–63. Research in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications.

292 *International Politics and Government in the Middle East* (3) Nimer
Spring—evening. Research and analysis of the international relations and major political problems of the Arab world and adjacent areas.

293–94 *Seminar: International Politics and Government in the Pacific Area* (3–3)
Academic year—evening. Research and analysis of the major patterns of development in internal and international politics of the area, with advanced study of the governmental institutions of the Far East. The Staff

299–300 *Thesis* (3–3)
Academic year—as arranged; summer 1962.

PSYCHOLOGY*

First Group

1 *General Psychology** (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. The fundamental principles underlying human behavior.

4 *Psychology of Adjustment* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.

* Psychology 1 is prerequisite to all other courses in Psychology.

22 *Introduction to Educational Psychology* (3) J. Johnson
Fall—evening; spring—day. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3) E. Johnson
Fall—day; spring—evening; summer 1962. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

SECOND GROUP*

101 *Abnormal Psychology* (3) Nolan, Hunt
Fall—day and evening; spring—day; summer 1962. The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.

129 *Introduction to Counseling and Guidance* (3) _____
Fall—evening; summer 1962. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.

131 *Psychological Tests* (3) Hunt
Fall—evening; spring—day; summer 1962. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7.

141 *Leadership, Group Behavior, and Student Life* (3) Kirkbride
Fall—day. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.

144 *Personnel Psychology* (3) Hubbard, Mosél
Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.

146 *Interpersonal Relations* (3) Schlesinger
Fall—day. The psychosocial processes involved in social interaction. The perception of other persons, social communication, small group processes, group problem-solving and change.

156 *Psychology of Propaganda and Public Opinion* (3) Tuthill
Spring—evening; summer 1962. The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

THIRD GROUP†

220 *Seminar: Abnormal Psychology* (3) Hunt
Fall—day; spring—evening. An intensive study of selected problems in the field of abnormal psychology.

225 *Seminar: Mental Hygiene* (3) Lindley
Fall—evening; spring—day. A study of mental health problems with special attention to needs of counselors.

231 *Test Construction* (3) Mosél
Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

* Six credits in first-group courses are prerequisite to all second-group courses.
† Open only to graduate students, except by special permission of Instructor and Chairman of the Department.

271–72 *Problems in International Politics and Organization* (3–3) Ludde
Academic year—day. A seminar to develop techniques of research in recent in
ternational affairs and to examine developments in international politics and organiza
tions.

273 *Public Opinion and Foreign Policy* (3) Ludde
Fall—evening. Development, organization, and operation of international informa
tion programs by major world powers. Public opinion in the United States influencing
the formation and conduct of foreign policy.

274 *Methods and Objectives of Foreign Policy* (3)
Spring—evening. Examination of the objectives of foreign policies of the major
powers, with attention to political, economic, and military methods used to pursue
these objectives. Davis

277 *Seminar: Latin American Government* (3)
Fall—evening; summer 1962. Analysis of the political structures of selected Latin
American republics. Two comparable governments studied each year. Davis

278 *Seminar: Latin American Political Philosophy* (3)
Spring—evening. Research in political personalities and philosophies of 19th and
20th century Latin America.

279 *Reading Course in International Affairs* (3)
Fall—evening; summer 1962. Reading and discussion of basic materials designed
to stimulate investigation of problems in the nature and development of international
law, politics, and organization. Brewer

281–82 *Seminar: International Law and Relations* (3–3) Research
First half: fall—evening; summer 1962. *Second half:* not offered 1962–63.
in the public law of nations, with special attention to problems of pacific settlement,
sanctions, war, neutrality, and state jurisdiction, and to their political implications.

292 *International Politics and Government in the Middle East* (3) Nimer
Spring—evening. Research and analysis of the international relations and major
political problems of the Arab world and adjacent areas.

293–94 *Seminar: International Politics and Government in the Pacific Area* (3–3)
Academic year—evening. Research and analysis of the major patterns of develop
ment in internal and international politics of the area, with advanced study of the gov
ernmental institutions of the Far East. The Staff

299–300 *Thesis* (3–3)
Academic year—as arranged; summer 1962.

PSYCHOLOGY*

First Group

1 *General Psychology** (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. The fundamental
principles underlying human behavior.

4 *Psychology of Adjustment* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Processes involved
in the total adjustment of the individual with emphasis on social environment; devel
opment in the individual of adjustment techniques.

* Psychology 1 is prerequisite to all other courses in Psychology.

22 *Introduction to Educational Psychology* (3) J. Johnson
Fall—evening; spring—day. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3) E. Johnson
Fall—day; spring—evening; summer 1962. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

SECOND GROUP*

101 *Abnormal Psychology* (3) Nolan, Hunt
Fall—day and evening; spring—day; summer 1962. The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.

129 *Introduction to Counseling and Guidance* (3) ———
Fall—evening; summer 1962. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.

131 *Psychological Tests* (3) Hunt
Fall—evening; spring—day; summer 1962. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7.

141 *Leadership, Group Behavior, and Student Life* (3) Kirkbride
Fall—day. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.

144 *Personnel Psychology* (3) Hubbard, Mosél
Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.

146 *Interpersonal Relations* (3) Schlesinger
Fall—day. The psychosocial processes involved in social interaction. The perception of other persons, social communication, small group processes, group problem-solving and change.

156 *Psychology of Propaganda and Public Opinion* (3) Tuthill
Spring—evening; summer 1962. The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

THIRD GROUP†

220 *Seminar: Abnormal Psychology* (3) Hunt
Fall—day; spring—evening. An intensive study of selected problems in the field of abnormal psychology.

225 *Seminar: Mental Hygiene* (3) Lindley
Fall—evening; spring—day. A study of mental health problems with special attention to needs of counselors.

231 *Test Construction* (3) Mosél
Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

* Six credits in first-group courses are prerequisite to all second-group courses.
† Open only to graduate students, except by special permission of Instructor and Chairman of the Department.

233 *Individual Psychological Testing* (3) E. Johnson
Fall—day; spring—day. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, $7.

234 *Seminar: Test Theory* (3) Mosél
1962-63 and alternate years: fall—evening. Development of the axiomatic-deductive theory underlying the major notions in the construction, evaluation, and application of psychological tests.

235 *Seminar: Psychological Measurement* (3) Hunt
Spring—evening. Advanced instruction in the use and interpretation of psychological tests, with emphasis upon group tests; survey of recent research in psychological measurement. Prerequisite: a course in psychological or educational measurement.

244 *Seminar: Job Analysis and Evaluation* (3) Mosél
Summer 1962.

245 *Seminar: Employee Motivation and Morale* (3) Mosél
Spring—evening. An analysis of organizational behavior, especially with regard to motivation and productivity. The implications of recent research on employee attitudes, the primary group, the effects of various patterns of supervisory leadership, the role of formal and informal organization, and job design.

246 *Seminar: Personnel Measurement Techniques* (3) Mosél
Fall—evening. Detailed consideration of the techniques of personnel selection and performance evaluation. The use of employment tests, personal data, assessment interviews, and performance ratings.

299, 300 *Thesis* (3–3)
Academic year—as arranged.

ROMANCE LANGUAGES AND LITERATURES

FRENCH

1–2 *First-year French* (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

3–4 *Second-year French** (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: French 1–2 or two years of high school French.

9–10 *French Conversation and Composition* (3–3) The Staff
Academic year—day and evening; summer 1962. Prerequisite: French 4 or the equivalent and permission of the instructor.

49 *French Readings for Nonmajor Students* (3) Frey and Staff
Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

* French 3–4 is required and French 51–52 is recommended as prerequisite to all second-group courses.

51–52 *Survey of French Literature and Civilization** (3–3) Metivier
Academic year—day and evening. The social, artistic, and cultural background of French civilization. Lectures, readings, recitations, and informal discussions.

SPANISH

1–2 *First-year Spanish* (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester.

3–4 *Second-year Spanish** (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester. Prerequisite: Spanish 1–2 or two years of high school Spanish.

9–10 *Spanish Conversation and Composition* (3–3) The Staff
Academic year—day and evening. Prerequisite: Spanish 4 or the equivalent and permission of the instructor.

49 *Spanish Readings for Nonmajor Students* (3) The Staff
Fall—evening; spring—evening. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51–52 *Survey of Spanish Literature and Civilization** (3–3) Supervia
1962–63 and alternate years: academic year—day. 1963–64 and alternate years: academic year—evening. The social, artistic, and cultural background of Spanish civilization. Lectures, readings, recitations, and informal discussion.

SLAVIC LANGUAGES AND LITERATURES

1–2 *First-year Russian* (3–3) Yakobson and Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening; summer 1962. *Second half:* fall—evening; spring—day and evening; summer 1962. A beginners' course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in electronic language workshop. Workshop fee, $6 a semester.

3–4 *Second-year Russian* (3–3) Yakobson and Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening. *Second half:* fall—evening; spring—day and evening. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Workshop fee, $6 a semester.

9–10 *Russian Conversation* (3–3) Olklovsky
Academic year—evening; summer 1962. Listening comprehension and oral practice. Prerequisite: Russian 3–4 or permission of the instructor. Workshop fee, $6 a semester.

* French 3–4 or Spanish 3–4 is required, and French 51–52 or Spanish 51–52 is recommended, as prerequisite to all seminar-group courses.

91–92 *Introduction to Slavic Literature* (3–3) Medish, Filipovitch
Academic year—day and evening. Lecture, recitation, and discussion. *First half:* a survey of Russian literature in translation from early periods through the literary masterpieces of the 19th century. *Second half:* a survey of other Slavic literatures, 18th century to the present, with emphasis on the contemporary scene.

SOCIOLOGY AND ANTHROPOLOGY

Baum

126 *Urban Sociology* (3)
1962–63 and alternate years: spring—day. The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.

SPEECH

Bielski

B *American Speech for Foreign Students* (3)
Fall—day and evening; spring—day and evening; summer 1962. Class limited to foreign-born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Recording fee, $5.

Leggette and Staff

1 *Effective Speaking* (3)
Fall—day and evening; spring—day and evening; summer 1962. Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, $2.

Henigan and Staff

2 *Persuasive Speaking* (3)
Fall—day; spring—day and evening. A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

STATISTICS

First Group*

The Staff

51 *Introduction to Business and Economic Statistics* (3)
Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening; summer 1962. Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

The Staff

52 *Mathematics of Finance* (3)
Lecture (3 hours). Fall—day and evening; spring—day and evening. Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra.

* Of first-group courses, Statistics 51, 52, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Statistics 52 lies outside of this group and may be taken for degree credit in combination with any one of the other three.

53 *Introduction to Statistics in Psychology and Education* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

91 *Principles of Statistical Methods** (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening; spring—day. Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

SECOND GROUP

104 *Statistics in Psychology and Education I* (3) Bright
Lecture (2 hours), laboratory (2 hours). Fall—Saturday morning; summer 1962. Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, $9.

105 *Statistics in Psychology and Education II* (3) Bright
Lecture (2 hours), laboratory (2 hours). Spring—Saturday morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53 or 104. Laboratory fee, $9.

106 *Factor Analysis* (3)
Summer 1962. Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, $9.

107 *Statistics for Engineers* (3) The Staff
Fall—evening; spring—evening; summer 1962. Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

109 *Managerial Statistics* (3)
Not offered 1962–63. Role of statistics and the contribution of statistical procedures in various phases of business management with emphasis on the need for and usefulness of the statistical method rather than the mechanics of analysis. Subject matter comprises sources and methods for collecting data, effective forms of presentation, techniques for summarizing and analyzing quantitative and qualitative information, interpretation of and inferences from available data. Admission by permission of the instructor or following Statistics 51.

110 *Quality Control Techniques* (3)
Not offered 1962–63. Applications of probability and distribution theory to industrial control problems; use of quality control charts; acceptance sampling plans; estimation of lot and process characteristics. Prerequisite: Statistics 51 or permission of instructor.

111 *Business and Economic Statistics I* (3) Johnson
Fall—day and evening. Statistical processes as related to the problems of business and economic research with emphasis on decision making under conditions of uncertainty. Topics include averages, dispersion, analysis of variance, correlation, quality control, and index numbers. Prerequisite: Statistics 51 or permission of instructor.

112 *Business and Economic Statistics II* (3) Johnson
Spring—day and evening. Specific problems of business and economics with statistics as a tool of analysis. Introduction to principles and use of linear programming.

* Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

game theory and queueing theory techniques. Study of various economic relationships, including demand, supply, cost and price functions. Prerequisite: Statistics 111 or equivalent.

117 *Analysis of Variance I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening. The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Prerequisite: Statistics 91. Laboratory fee, $9.

118 *Correlation and the Chi-square Test I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Spring—evening; summer 1962. Regression and correlation theory: simple, partial, and multiple; nonparametric methods; analysis of covariance; contingency table analysis; tests of goodness of fit. Prerequisite: Statistics 91. Laboratory fee, $9.

121 *Index Numbers* (3)
Not offered 1962–63. Definition and theory of index numbers, methods of construction, their interpretation, use, and limitations. Prerequisite: Statistics 51 or the equivalent. Johnson

122 *Forecasting Principles and Techniques* (3)
Spring—day. Survey and appraisal of techniques for measuring the state of business conditions and an examination of current indicators. Study of procedures for estimating future values: budget requirements, price levels, or level of general business activity. Prerequisite: Statistics 51 or the equivalent. Johnson

123 *Introduction to Econometrics* (3)
Fall—day. A basic quantitative approach to fundamental problems in economic theory involving the use of statistical processes, simple model construction, and probability considerations. Prerequisite: elementary course in Economics and Statistics. The Staff

155 *Introduction to Mathematical Probability* (3)
Fall—day; spring—evening; summer 1962. Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers. Prerequisite: permission of instructor. Kupperman

157–58 *Mathematical Statistics* (3–3)
Academic year—day and evening. Distribution theory, sampling theory, estimation, hypothesis testing, confidence methods, regression analysis, experimental design. Prerequisite: differential and integral calculus. Geisser

189–90 *Mathematical Probability and Applications* (3–3)
Academic year—evening. Combinatorial analysis, conditional probability and stochastic independence, probability distributions, laws of large numbers, recurrent events, random walks, Markov chains, simple time-dependent stochastic processes. Prerequisite: Statistics 155 or permission of instructor. Bright

191 *Statistical Mathematics I** (3)
Fall—evening. Problems in statistics with the development of processes from modern algebra necessary for their solution. Prerequisite: differential and integral calculus or permission of instructor.

192 *Statistical Mathematics II* (3)
Lecture (2 hours), laboratory (2 hours). Not offered 1962–63. Linear computations as applied to least squares, multiple correlation, regression, and analysis of variance problems. Prerequisite: Statistics 191 or the equivalent. Laboratory fee, $9. The Staff

193 *Statistical Mathematics III** (3)
Spring—evening. Problems in statistics with the development of real variable theory necessary for their solution. Prerequisite: differential and integral calculus. The Staff

194 *Statistical Mathematics IV** (3)
Fall—evening. Problems in statistics with the development of complex variable theory necessary for their solution. Prerequisite: differential and integral calculus.

* Statistics 191, 193, and 194 or the equivalent are prerequisite to all third-group courses

195–96 *Reading and Research in Statistics* (arr.) The Staff
Academic year—as arranged.

199–200 *Proseminar: Theoretical and Applied Statistics* (3–3) The Staff
Not offered 1962–63. In addition to the study of recent advances in statistical methods, this course is designed to coordinate the content of the baccalaureate major. Admission by permission of the instructor.

THIRD GROUP*

201 *Design of Experiments* (3)
Not offered 1962–63. Relative merits of random, repeated, stratified, and double sampling; Fisher-Pitman method of randomization; randomized blocks; Latin squares; factorial design; confounding, partial confounding.

203–4 *The Theory of Econometrics* (3–3)
A year course; credit is not given for the first half until the second half is completed.
Not offered 1962–63. Statistical methods applied to analysis of production, supply, and demand; utility and disutility; interest and taxation; exchange. Emphasis on interpretation of results in terms of probability, correlation, and regression of time series. Admission by permission of the instructor.

205–6 *Advanced Business and Economic Statistics* (3–3)
Not offered 1962–63. Application of statistical methods to specific problems utilizing case method when possible. Emphasis on source materials, role of statistical methods, techniques of analysis, interpretation and presentation of results. Original work is required of each student. Prerequisite: Statistics 112 or the equivalent.

207 *Operations Analysis* (3) Bright
Fall—evening. Basic concepts and techniques of operations analysis as applied to problems in business management and economic research. An introduction to the processes of linear programming, game theory, and queueing theory. Admission by permission of the instructor.

211 *Theory of Sampling* (3) Bright
Spring—evening. Problems of sampling and sample design. Admission by permission of the instructor.

212 *Nonparametric Statistical Inference* (3)
Not offered 1962–63. Spring—1964. Statistical inference when the form of the underlying distribution is unknown; sign tests; rank order statistics; theory of runs; nonparametric discriminant analysis.

217 *Analysis of Variance II* (3)
Not offered 1962–63. Advanced theory of the applications of the linear hypothesis to research problems. Distributions of the analyses of variance. Extensions to multiple classifications with unequal cell frequencies. Studies of multiple contrasts and their importance. Normal versus non normal problems.

218 *Correlation and the Chi-square Test II* (3)
Not offered 1962–63. Spring 1965. Theoretical analysis of simple, partial, and multiple regression. Examination of various distributions encountered. Rank correlation techniques and their distributions. Distribution of the chi-square statistic.

257–58 *Advanced Mathematical Statistics* (3–3) Kupperman
Academic year—evening. Random variables and probability distributions, distribution functions and their properties, convergence theorems, regression and correlation, multivariate normal distribution, asymptotic and exact sampling distributions, estimation, hypothesis testing.

259–60 *Advanced Mathematical Probability* (3–3)
A year course; credit is not given for the first half until the second half is completed.
Not offered 1962–63. Modern theories and asymptotic laws; elementary theory of definite integration; limit theorems in probability.

* Statistics 191, 193, and 194 or the equivalent are prerequisite to all third-group courses.

261–62 *Information Theory for Engineers* (3–3) Kullback
Academic year—evening. The elements of information theory and its statistical and probabilistic background from an elementary point of view (nonmeasure-theoretic). Measures of information, entropy, and their properties. Discrete stochastic sources. Message ensembles. The transmission of information, channels, channel capacity. Encoding and decoding including error detection and correction. The fundamental theorems of information theory.

263–64 *Statistical Inference* (3–3) Greenhouse
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Sample space; methods for estimating population parameters; fiducial inference and its application to testing hypotheses; valid, efficient, and exact estimation; Student's distribution; variance distribution; sampling statistics. Prerequisite or concurrent registration: Statistics 257–58 or the equivalent.

265–66 *Multivariate Analysis* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Tests of significance, generalized variance and covariance, tests of independence, canonical and vector correlations, multivariate, normal distribution, generalized Student's ratio, problems of estimation, applications to factor analysis.

267–68 *Characteristic Functions* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Fourier integrals, set functions, inversion formulas, limit theorems, applications to the distribution problem in statistics.

269 *Sequential Testing* (3)
Not offered 1962–63.

270 *Statistical Decision Theory* (3)
Not offered 1962–63.

271–72 *Statistical Information Theory* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shannon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing. Asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison of experiments. Kullback

273–74 *Stochastic Processes* (3–3)
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Fundamental notions of stochastic processes; random walks; Markov processes; differential processes; Gaussian processes; applications. The Staff

295–96 *Reading and Research* (3–3)
Academic year—as arranged. Admission by permission of the instructor. The Staff

299–300 *Thesis* (3–3)

Courses Offered in Special Programs

In addition to the regular courses announced above the University offers the following courses for students enrolled in the following special programs: Navy Graduate Financial Management Program, Air Force Advanced Management Program, Engineering Administration, and Hospital Administration.

101 *Basic Principles of Statistical Methods* (3)
Variables and attributes, averages and dispersion, elementary principles of sampling, introduction to the making of statistical decisions.

119 *The Bases of Statistical Decision Making* (arr.)
Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.

120 *Principles of Statistical Analysis* (3)
Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses.

250 *Managerial Statistics and Quality Control* (3)
The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

ZOOLOGY

BIOLOGY*

1-2 *Introductory Biology** (4–4) The Staff
An interdepartmental course. Lecture (2 hours), laboratory (4 hours).
Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.
Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.
This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

* Beginning with the academic year 1965–66: Biology 1-2 *Introductory Biology* (4–4) replaces Botany 1-2 *General Botany* (4–4) and Zoology 1-2 *Introduction to Zoology* (4–4). Botany 1-2 and Zoology 1-2 will be offered for the last time in the summer of 1965.

INDEX

A

Academic status of the University, 3
Accounting courses, 50–53
Administration, Officers of, 2
Admission, 11–13
Air Force ROTC, 17, 21, 25–26, 42–43
Amount of Work, 24
Attendance, 20, 23
Auditor, 16, 21, 22

B

Behavioral Sciences, Center for, 41
Biology courses, 53–54, 89
Botany course, 53–54
Buildings of the University, 4–6
Business Administration courses, 55–59
Business and Public Administration courses, 54–55

C

Calendar for 1962–63, iv–vi
Changes in program of studies, 21–22
Chemistry courses, 63
Classification of students, 24
Committees of the Faculty, 10
Credit:
  Explanation of amount of, 50
  For Correspondence and Home Study Courses, 27
  For summer school work, 27
  From other institutions, 12
  Transfer of, within the University, 15, 22

D

Degrees:
  Undergraduate, 24–33
  Graduate, 33–40
Dishonesty, regulations concerning, 21
Dormitories, 45
Dropping courses, 15, 21

E

Economics courses, 63–66
Engineering courses, 67
English:
  Correct use of, 27
  Courses, 67–68
Entrance requirements, 12–13
Examinations:
  Advanced Placement, 12
  Graduate Record, 15, 23, 26
  Physical, 15, 43
  Qualifying, 27

F

Faculty, alphabetical list, 7–9
Fees and financial regulations, 14–17
Fellowships, 17–18
Foreign students, 46
French courses, 82–83

G

Geography courses, 68–70
Geology course, 70
German courses, 70–71
Grades, 15, 24–25, 35
Graduation:
  Application for, 22
  Requirements, 22–23

H

Health Care Administration Program, 61
Health services, student, 43–44
History courses, 71–74
Honors, 25–26
Hospital Administration courses, 60–61
Hours of Instruction, 50

I

Independent study plan, 20–21
"In residence status", 14
Institute for Sino-Soviet Studies, 41

L

Language requirements, Master's, 33–34
Library, 6
Loan Funds, 20
Lost and Found Office, 23

M

Mathematics courses, 74–75

P

Philosophy course, 76
Physical Education courses, 76
Physical examinations, 15, 43
Physics courses, 76
Political Science courses, 76–80
Prizes, 19
Probation, 26
Psychology courses, 80–82
Public Administration courses, 61–63

Q

Quality-point index, 26

R

Reading Clinic, 44
Refunds, 16–17, 45
Registration, 14
Regulations, 20–24
Residence Halls, 45
Russian courses, 83–84

S

Scholarships, 18–19
Self Help, 19–20, 46
Sino-Soviet Studies, Institute for, 41
Sociology and Anthropology course, 83
Spanish courses, 83
Special Programs, 40–41
Speech courses, 84
Statistics courses, 83–89
Student:
  Activities, 46–48
  Employment, 19, 46
  Life, 45–49
Suspension, 26

T

Testing and Counseling Center, 44
Transcripts of record, 22
Transfer within the University, 22
Trustees, Board of, 1

V

Veterans Education, 41–42

W

Withdrawal, 16–17, 21

Z

Zoology course, 89

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Columbian College of Arts and Sciences: Associate in Arts (A.A.), Associate in Science (A.S.), Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)

Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

National Law Center:

Law School: Bachelor of Laws (LL.B.)

Graduate School of Public Law: Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L. (Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

School of Engineering: Engineering Technologist Certificate (Eng. Tech. Cert.), Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (A.P.C.), and Doctor of Education (Ed.D.)

School of Government, Business and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

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School of Government, Business,
and International Affairs.....Director of Admissions
School of Medicine.....Director of Admissions
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Schedule of Classes: Fall and Spring Semesters.....Registrar
Schedule of Classes: Summer Sessions.....Dean of the Summer Sessions

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1959

THE LAW SCHOOL, 1865

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THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

The George Washington University

Bulletin



THE SCHOOL OF EDUCATION

1962-63

WASHINGTON 6, D. C.
MAY 1962
Vol. LXI No. 11

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Doctor of Philosophy.....Dean of The Graduate Council

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SECOND CLASS POSTAGE PAID AT WASHINGTON, D. C.

The George Washington University

Bulletin

THE SCHOOL OF EDUCATION
1962-63

VOLUME LXI MAY 1962 NUMBER 11

24th STREET
New Hampshire Ave.
Student Parking Lot #1
Hospital Parking
23rd STREET
Temple Hall
Nurses Residence
Hospital Office Bldg.
University Hospital
22nd STREET
Student Parking Lot #2
Student Parking Lot #3
Chapin Hall
Student Union
Crawford Hall
Classics Hall
G STREET
H STREET
EYE STREET
PENNSYLVANIA AVE.
21st STREET
Woodhull House
Gymnasium
Infirmary Hall
Dana Study and Store
Stuart Hall
20th STREET
Hopkins Observatory House
Adams Hall
19th STREET
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CONTENTS

	PAGE
Calendar of the School of Education	v
The Board of Trustees of the University	1
Officers of Administration	2
The School of Education	3
Faculty and Staff of Instruction	3
General Information	5
The Education of Teachers	6
The Bachelor's Degrees	7
Bachelor of Science in Physical Education	7
Bachelor of Arts in Education	11
Five-year Programs Leading to the Degrees of Bachelor of Arts and Master of Arts in Education	24
The Degree of Master of Arts in Education	25
Advanced Professional Certificate	27
The Degree of Doctor of Education	28
Reading Clinic	30
Special Curricula	30
Admission	30
Readmission	31
Registration	32
Fees and Financial Regulations	32
Regulations	35
Amount of Work	35
Attendance	35
Scholarship	35
Withdrawal	37
Changes in Program of Studies	37
Credit	38
Summer School Credit	38
Graduation Requirements	38
The Library	40
Fellowships, Scholarships, Prizes, Financial Aid	41
Student Life	42
Courses of Instruction	44
Education	45
Physical Education	52
Psychology	55
Statistics	56
Index	57

1962

July

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September

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October

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December

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CALENDAR OF THE SCHOOL OF EDUCATION

1962–63

1962

FALL SEMESTER:

Orientation Assembly: all new students	Sept 14 ..... Fri
Curriculum assemblies: new students attend one	Sept 14 and 17..... Fri and Mon
Placement tests	Sept 18 ..... Tues
Registration	Sept 20–22* ..... Thurs–Sat
Classes begin	Sept 24 ..... Mon
Subjects of Master's theses of Feb candidates due	Oct 5 ..... Fri
Dissertation subjects of June Ed.D. candidates due	Oct 5 ..... Fri
General Education activities plans due from A.B. in Ed. Feb entrants.....	Oct 22 ..... Mon
Application for Feb graduation due in Registrar's Office	Oct 31 ..... Wed
Graduate Studies Committee meets	Nov 2 ..... Fri
Application for Nov Ed.D. Comprehensive examinations due	Nov 3 ..... Sat
Veterans Day. Holiday	Nov 12 ..... Mon
Ed.D. comprehensive examinations	Nov 17 ..... Sat
Thanksgiving recess	Nov 22–24 ..... Thurs–Sat
Ed.D. and A.M. in Ed. Jan comprehensive examination applications due	Dec 5 ..... Sat
Christmas recess	Dec 22–Jan 2 ..... Sat–Wed

1963

Classes resume	Jan 3 ..... Thurs
Theses and dissertations of Feb. candidates due	Jan 3 ..... Thurs
Ed.D. and A.M. in Ed. comprehensive examinations	Jan 5 ..... Sat
Graduate Studies Committee meets	Jan 18 ..... Fri
Examination period	Jan 21–26 ..... Mon–Sat

SPRING SEMESTER:

Registration	Jan 31–Feb 2* ..... Thurs–Sat
Spring semester classes begin	Feb 4 ..... Mon
Subjects of Master's theses of June candidates due	Feb 8 ..... Fri
Winter Convocation	Feb 22 ..... Fri
Application for June graduation due in Registrar's Office	Feb 28 ..... Thurs
General education activities plans due from A.B. in Ed. Feb entrants.....	March 4 ..... Mon
Ed.D. dissertations of June candidates due	March 29 ..... Fri

* Thursday and Friday from 12:00 to 8:00 P.M., Saturday from 8:30 A.M. to 1:00 P.M.

Dissertation subjects of Feb 1964 Ed.D. candidates due	March 30 ..... Sat
Application for 1963–64 scholarships due	April 1 ..... Mon
Easter recess	April 12–17 ..... Fri–Wed
Ed.D. and A.M. in Ed. April comprehensive examination applications due	April 13 ..... Sat
Ed.D. and A.M. in Ed. comprehensive examinations	April 27 ..... Sat
Master's theses of June candidates due	May 1 ..... Wed
Graduate Studies Committee meets	May 10 ..... Fri
Examination period	May 20–25 ..... Mon–Sat
Memorial Day. Holiday	May 30 ..... Thurs
Baccalaureate service	June 2 ..... Sun
Commencement	June 5 ..... Wed.

SUMMER SESSIONS:

Twelve-week session: registration and first day of classes for first six-week evening classes	June 10 ..... Mon
Nine-week workshop session: registration for first-block classes	June 17 ..... Mon
Eight-week session: registration	June 17 ..... Mon
Nine-week workshop session: first-block classes begin	June 18 ..... Tues
Eight-week classes begin	June 18 ..... Tues
Independence Day. Holiday	July 4 ..... Thurs
Nine-week workshop session: registration for second-block three-week classes	July 8 ..... Mon
Six-week session: registration	July 8 ..... Mon
Nine-week session: second-block three-week classes begin	July 9 ..... Tues
Six-week session: classes begin	July 9 ..... Tues
Ed.D. and A.M. in Ed. July comprehensive examination applications due	July 10 ..... Wed
Twelve-week session: first six-week evening classes end	July 19 ..... Fri
Twelve-week session: registration and first day of classes for second six-week evening classes	July 22 ..... Mon
Ed.D. and A.M. in Ed. comprehensive examinations	July 24 ..... Wed
Nine-week session: registration and first day of classes for third-block three-week classes	July 29 ..... Mon
Graduate Studies Committee meets	Aug 7 ..... Wed
Eight-week session ends	Aug 9 ..... Fri
Nine-week session: third-block three-week classes end	Aug 16 ..... Fri
Six-week session ends	Aug 16 ..... Fri
Twelve-week session: second six-week evening classes end	Aug 30 ..... Fri

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† On leave of absence fall semester 1962-63.

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GENERAL INFORMATION

INTRODUCTORY

It is the purpose of the School of Education to prepare teachers, counselors, and administrators for the higher ranges of educational service and to offer opportunities to teachers of experience to extend their education. The School includes the departments of Education, Physical Education, and Home Economics. It offers both graduate and undergraduate work. Other departments of the University provide general education and subject-matter courses needed for a well-balanced program of teacher education. In addition to programs of study leading to the degrees, the School offers nondegree programs for certification.

Special curricula are provided for liberal arts graduates, housewives, and retired military personnel who wish to prepare for teaching. The School also provides a wide range of courses of interest to emergency teachers who wish to qualify for teaching certificates and teachers who wish to renew licenses.

Laboratory and clinical facilities are provided by the University Reading and Speech clinics. In cooperation with public and private schools and a wide variety of social agencies, ample opportunity for field experience is provided.

The schedule of courses is arranged to meet the convenience of both full-time and part-time students. By attending evening, Saturday, and summer classes, teachers in the schools of the metropolitan Washington area and others within commuting range may complete all the requirements for a degree without giving up their positions.

HISTORICAL DEVELOPMENT

The University began offering professional courses for teachers in 1904–5 and in 1907 it established a Division of Education. In 1909, the Division of Educa-

* The Dean and Assistant Dean of the School of Education are members ex officio of all committees.
† Elected by the Faculty.
‡ Appointed by the Dean.

tion became the Teachers College which, in its early years, was concerned largely with teacher preparation on the undergraduate level.

In 1928, the Teachers College became the School of Education and greater provision was made for advanced study. Since that time the graduate enrollment has steadily increased with the result that today the School has a considerably larger number of graduate than undergraduate students.

ADVANTAGES OF STUDY IN THE NATION'S CAPITAL

Washington is rich in the resources needed by teachers, counselors, and administrators to supplement classroom instruction. In addition to the library facilities of the University, the Library of Congress; the Library of the Department of Health, Education, and Welfare; and many special collections provide unexcelled opportunities for reading and research. The operation of all branches of the National Government may be observed. Among the art galleries are the National Gallery of Art, the Corcoran Gallery of Art, the Freer Art Gallery, Phillips Memorial Gallery, and the National Museum. The music calendar of Washington is a full one, and includes concerts by the National Symphony Orchestra, Philadelphia Orchestra, and the Boston Symphony Orchestra. Those interested in science find many resources for study at the National Museum, the National Zoological Park, the United States Botanic Garden, and the Aquarium of the Fish and Wildlife Service, Department of the Interior. Students have unique opportunities to become acquainted with the work of the Office of Education, the National Education Association, the American Council on Education and many other national organizations with headquarters in Washington.

ACADEMIC STATUS

The George Washington University is accredited by the regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Education is accredited by the National Council for Accreditation of Teacher Education, is a member of the American Association of Colleges for Teacher Education, and was a charter member of the National Association of Colleges and Departments of Education prior to the merger of that association with others to form the American Association of Colleges for Teacher Education.

THE EDUCATION OF TEACHERS

Programs of study for the education of teachers are based upon the assumption that every teacher should have a broad general education, adequate mastery of the content of instruction, and professional competence.

The relative emphasis placed upon each of these aspects of the total education of teachers varies in accordance with the purposes of each program. For instance, elementary school teachers, since they teach all subjects, require content preparation of greater breadth and less specialization than secondary school teachers.

It is the view of the School of Education that an acceptable minimum education

for teaching requires not less than four years of full-time study or the equivalent part-time study. For superior preparation teachers are urged to plan for five years of full-time study or the equivalent part-time study.

The student may choose any one of the following three plans to achieve superior educational preparation for teaching:

1. Upon receiving the Bachelor's degree, he may take a teaching position and, after acquiring some professional experience, return to the School for graduate study leading to the Master's degree. This plan enables students with Bachelor's degrees to start earning immediately and, by teaching experience, to illuminate graduate study which will follow. However, by delaying acquisition of the Master's degree the student cannot command the higher salary usually associated with this degree and may prejudice his opportunity for promotion.

2. The student may choose to pursue full-time graduate study leading to the Master's degree immediately after receiving the Bachelor's degree. This plan is of advantage to students who wish to defer the decision to seek a Master's degree until completion of the undergraduate program and to students transferring from other institutions, whose transferred credits fit more readily into this plan than into the five-year plan discussed below. Both this program and the five-year program enable the student to command a higher beginning salary and be considered for early promotion.

3. For those whose professional aims are established at the beginning of the junior year, the School offers a five-year integrated program of study leading to the Bachelor's and Master's degrees conferred simultaneously. This program permits careful planning from the outset to meet the demands of the teaching position for which the student is preparing; it permits adequate mastery of the content of instruction in two teaching fields; and advances the professional sequence of courses to the fourth and fifth years, thus providing a more adequate academic preparation. Students are advised to choose the five-year program if possible.

The first two years of all programs of study are administered by Columbian College of Arts and Sciences of the University. During these two college years the student is encouraged to follow the curriculum designed to prepare him for the program of studies he wishes to pursue later in the School of Education. Students who have followed other curricula may be admitted to the School of Education with deficiencies which they must make up before graduation. Members of the Faculty of the School of Education serve as advisers to students enrolled in Columbian College of Arts and Sciences curricula leading to degree programs in the School of Education. For each registration students must have their programs approved by their advisers. They are also urged to seek counsel in the budgeting of time for the inclusion of extracurricular student activities and off-campus cultural opportunities for the development of a well-rounded personality.

THE BACHELOR'S DEGREES

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION*

Bachelor of Science in Physical Education for Men

There are three curricula leading to this degree. The curriculum in Physical Education with an academic Minor is designed to prepare students for teaching

* Physical Education may also be chosen as a minor teaching field by candidates for the degree of Bachelor of Arts in Education. See page 19

positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The curriculum in Physical and Health Education prepares for the teaching of physical education in the larger schools. The curriculum in Physical Education and Recreation is planned for those who wish to be prepared to direct programs of recreation in addition to the teaching of physical education.

Prerequisite

The following two-year curriculum offered in the lower division of Columbian College of Arts and Sciences, is required for admission to the School of Education as a candidate for the degree of Bachelor of Science in Physical Education for Men.

		Semester Hours
English	English 1 or 1X, 2	8
Science	Biology 1–2* (Freshman year)	8
	Chemistry 3–4 (Sophomore year)	8
Social Studies	History 71–72; Political Science 1 and 9, 1 and 10, or 9–10	6
	Anthropology 1 and Sociology 2	6
Major Prerequisites	Physical Education 41, 43–44, 47; Speech 1 or 11 (Freshman year)	10
	Physical Education 45–46, 49, 50, 58; Psychology 1, 22 (Sophomore year)	18
Elective		2
	Total	64

Curriculum Requirements

The minimum requirements for this degree are 66 semester hours, distributed as follows:

Curriculum in Physical Education With an Academic Minor

		Semester Hours
	JUNIOR YEAR	
Education 108	Human Development, Learning, and Teaching	3
Education 123	Society and the School	3
Physical Education 105	Adapted Physical Education and Physical Examinations	1
Physical Education 107	Teaching Recreational Dance	4
Physical Education 113–14	Practice in Teaching Physical Education	3
Physical Education 121	School and Community Health Programs	3
Physical Education 122	Methods and Materials for Health Education	3
Physiology 115	Physiology	4
Academic Teaching Field		6
Elective		3
	Total	33

		Semester Hours
	SENIOR YEAR	
Education 131	Principles and Methods of Secondary School Teaching	6–9
Education 134	Student Teaching in Secondary Schools	3
Physical Education 103	History and Principles of Physical Education	4
Physical Education 115–16	Teaching Team Sports in Secondary Schools	3
Physical Education 131	Tests and Measurements in Physical Education	3

* An interdepartmental course offered by the departments of Botany and Zoology. The student may register in either department.

		Semester Hours
Physical Education 138	Organization and Administration of Physical Education	3
Academic Teaching Field		8–11
	Total	30–36

Curriculum in Physical and Health Education

JUNIOR YEAR		Semester Hours
Education 108	Human Development, Learning, and Teaching	3
Education 123	Society and the School	3
Physical Education 107	Teaching Recreational Dance	1
Physical Education 109–10	Leadership Organization in the Intramural Program	4
Physical Education 113–14	Practice in Teaching Physical Education	4
Physical Education 121	School and Community Health Programs	3
Physical Education 122	Methods and Materials for Health Education	3
Physiology 115	Physiology	3
Elective		9
	Total	33

SENIOR YEAR		Semester Hours
Education 131	Principles and Methods of Secondary School Teaching	3
Education 134	Student Teaching in Secondary Schools	6–9
Physical Education 103	History and Principles of Physical Education	3
Physical Education 105	Adapted Physical Education and Physical Examinations	3
Physical Education 115–16	Teaching Team Sports in Secondary Schools	4
Physical Education 131	Tests and Measurements in Physical Education	3
Physical Education 138	Organization and Administration of Physical Education	3
Elective		5–8
	Total	30–36

Curriculum in Physical Education and Recreation

JUNIOR YEAR		Semester Hours
Education 108	Human Development, Learning, and Teaching	3
Education 123	Society and the School	3
Physical Education 48	Introduction to Recreation	2
Physical Education 107	Teaching Recreational Dance	1
Physical Education 109–10	Leadership Organization in the Intramural Program	4
Physical Education 113–14	Practice in Teaching Physical Education	4
Physical Education 121	School and Community Health Programs	3
Physical Education 132	Camp Leadership	1
Physical Education 151–52	Recreational Leadership Activities	6
Elective		6
	Total	33

SENIOR YEAR		Semester Hours
Education 131	Principles and Methods of Secondary School Teaching	3
Education 134	Student Teaching in Secondary Schools	6–9
Physical Education 103	History and Principles of Physical Education	3
Physical Education 122	Methods and Materials for Health Education	3
Physical Education 131	Tests and Measurements in Physical Education	3
Physical Education 138	Organization and Administration of Physical Education	3
Physical Education 161	Community Organization for Recreation	3

		Semester Hours
Physical Education 162	Administration of Community Recreation Programs	3–6
Elective		
	Total	30–36

Bachelor of Science in Physical Education for Women

The Physical Education major curriculum is designed to prepare students for teaching in elementary and secondary school programs of physical education.

Within this curriculum there is opportunity for specialization in dance, corrective physical education, health education, and recreation.

The student wishing to prepare to teach another subject in addition to physical education may do so by using her elective hours to work toward a minor teaching field. Relevant work completed in Columbian College of Arts and Sciences may be counted.

PREREQUISITE

The following two-year curriculum, offered in the lower division of Columbian College of Arts and Sciences, prepares for the Bachelor of Science in Physical Education curriculum in the School of Education.

		Semester Hours
English	English 1 or 1X, 2	6
	English 51–52, 71–72, or 91–92	6
Physical Education	1–2, 11–12	4
Science	Biology 1–2* (Freshman year)	8
	Chemistry 3–4 (Sophomore year)	8
Social Studies	History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10; or Anthropology 1 and Sociology 2	6
Major Prerequisites	Physical Education 43–44 (Freshman year)	4–6
	Physical Education 49, 50, 51 52; Psychology 1, 22	16–18
	(Sophomore year)	2–6
Academic Electives		64
	Total	

		Semester Hours
	JUNIOR YEAR	
Education 108	Human Development, Learning, and Teaching	3
Education 123	Society and the School	3
Physical Education 105–6	Adapted Physical Education and Physical Examinations	6
Physical Education 107	Teaching Recreational Dance	1
Physical Education 111–12	Teaching Physical Education Activities	4
Physical Education 117	Teaching Modern Dance	1
Physical Education 118	Dance Production	1
Physical Education 121	School and Community Health Programs	3
Physical Education 122	Methods and Materials for Health Education	3
Physical Education 132	Camp Leadership	1
Physiology 115	Physiology	3
Elective or minor teaching field		5
	Total	34

		Semester Hours
	SENIOR YEAR	
Education 131	Principles and Methods of Secondary School Teaching	3
Education 134	Student Teaching in Secondary Schools	6–9
Physical Education 101	Physical Education in the Elementary School	3

* An interdepartmental course offered by the departments of Botany and Zoology. The student may register in either department

	Semester Hours
Physical Education 103.....History and Principles of Physical Education.....	3
Physical Education 107.....Teaching Recreational Dance.....	1
Physical Education 113.....Practice in Teaching Physical Education Activities.....	3
Physical Education 131.....Tests and Measurements in Physical Education.....	3
Physical Education 138.....Organization and Administration of Physical Education	3
Elective or minor teaching field.....	5–8
Total.....	30–36

BACHELOR OF ARTS IN EDUCATION

The objective of programs leading to the degree of Bachelor of Arts in Education is to provide (1) general educational backgrounds; (2) functional command of ideas, concepts, knowledge, and skills in one or more teaching fields; (3) mastery of basic professional information and skills adequate for the beginning teacher; and (4) development of attitudes needed for success in teaching. Since the contents of teaching fields differ in scope and complexity, some programs are longer than others in terms of semester hours. None require less than 126 semester hours of satisfactory work, exclusive of required Physical Education.

Normally, from 60 to 64 semester hours of the total requirement are completed in Columbian College of Arts and Sciences of the University or in an equivalent institution elsewhere.

General Education

The general educational backgrounds needed by prospective teachers are obtained through: (1) precollege education, (2) college courses, (3) work experience, (4) leadership activities, (5) participation in student campus activities, and (6) utilization of off-campus cultural opportunities.

College course requirements of the pre-Education curriculum.—Course requirements depend in part upon the senior high school credits presented for college admission. They are as follows:

English	Semester Hours
English 1 or 1X, 2: English Composition.....	6

Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared are assigned to English 1X. English 1 or 1X is a prerequisite to all other courses in English.

One of the following survey courses in literature.....	6
English 51–52: Introduction to English Literature	
English 71–72: Introduction to American Literature	
English 91–92: Introduction to European Literature	

Foreign Languages	
French, German, Latin, Russian, or Spanish.....	12

A student offering for admission four acceptable high school units of a single foreign language, or the equivalent, is not required to take any foreign language. If he offers three units, he must complete the second semester of the second-year college course in the same language. If he offers two units, he must complete the entire second-year college course in the same language. If he offers one unit, he must complete the second semester of the first-year college course and the second-year course in the same language.

Semester Hours

Physical Education

Physical Education 1–2 and 11–12
A student may be exempted from this requirement if registered for less than three courses or regularly employed during the day.

Science

Three semesters (two in biological science and one in physical science or vice versa) to supplement senior high school courses in these fields and chosen from the following 9-12

- Biology 1–2: Survey in Biology*
- Chemistry 3–4: Fundamentals of Physical Sciences
- Chemistry 11–12: General Chemistry
- Geology 1–2: Introductory Geology
- Physics 11, 12: Introductory Physics

(A student offering for admission two or more acceptable senior high school units in the above areas of science may be exempted from one semester of this requirement.)

Mathematics

Two semesters to supplement senior high school courses chosen from the following 6

- Mathematics 3: College Algebra
- Mathematics 6: Plane Trigonometry
- Mathematics 9: General Mathematics I
- Mathematics 10: General Mathematics II

Social Studies

History 71–72: The Development of the Civilization of the United States or 6
Political Science 1 and 9, 1 and 10, or 9–10 6
Another Social Science chosen from the following courses 3

- Economics 1–2: Principles of Economics
- Geography 51, 52: Introduction to Geography; World Regions
- History 39–40: The Development of European Civilization
- History 71–72: The Development of the Civilization of the United States
- Political Science 1 and 9, 1 and 10, or 9–10: Introduction to Government; Government of the United States
- Religion 59–60: History of Religion
- Anthropology 1: Man, Culture, and Society I
- Sociology 2: Man, Culture, and Society II

(A student offering for admission two or more acceptable senior high school units in the Social Studies may be exempted from this requirement.)

Other Courses

Psychology 1: General Psychology 3
Psychology 22: Educational Psychology 3
Speech 1: Effective Speaking (or 11: Voice and Diction, if the Department so advises) 3

Students who demonstrate marked superiority in Speech may be exempted from this requirement. Such exemption is granted only on the recommendation of the Department of Speech.

Academic Electives

Electives may be increased through the various exemptions 60

Minimum required credits 120

Work experience, leadership activities, participation in student campus activities, and ***the utilization of off-campus cultural opportunities.***—Obviously, these cannot

* An interdepartmental course offered by the departments of Botany and Zoology. The student may register in either department.

be prescribed. Nevertheless, they constitute an important part of the general educational background of prospective teachers. In conference with a staff member of the Department of Education assigned as his general adviser, the student is expected to plan adequate experiences in these areas. Not later than one month after matriculation in the School of Education the student must file in the Office of the Dean a statement of such plans approved by his adviser. He must also keep his adviser informed concerning the fulfillment of his plans and to this end include in plans filed, scheduled conferences with his adviser.

Success of the student in enriching his general educational background by these means will be taken into consideration at the end of the first semester of the junior year when the faculty will review the qualifications of candidates to determine any who are not of sufficient promise as prospective teachers to warrant continuation of their candidacies. Success in these activities will also be considered when the list of candidates is again reviewed early in the last semester of the senior year immediately after the results of the National Teacher Examinations are available. In estimating the success of the student in this connection, more weight will be given to evidence of initiative, eagerness to make the most of each experience, balance, and quality of experience than to the number of different experiences.

Although the student is not required to establish a program of nonacademic activities until he becomes a degree candidate in the School of Education, he is advised to do so as soon as he enters the University. To this end, he should consult the pre-Education adviser soon after entering. Whatever is accomplished in this connection while in Columbian College of Arts and Sciences will reduce the obligations of the student after admission to the School of Education.

Teaching-Field Preparation

Teaching-field preparation depends upon the kind of teaching position for which the student is preparing. Those planning to teach in elementary schools need a degree of competency in several fields. Those preparing to teach in junior or senior high schools, as a rule, must demonstrate competency in a major teaching field and a minor teaching field. With the approval of the student's adviser, preparation in a minor teaching field may be omitted in order to permit additional study in the major teaching field. Ordinarily, students preparing to teach in evening schools for adults are required to prove competency in only one teaching field.

The student should begin teaching-field preparation while in the lower division of Columbian College of Arts and Sciences and should make provision for it in planning his program of studies.

Teaching-field requirements include satisfactory completion of prescribed academic courses in one or more fields, a satisfactory score on the special field examination of the National Teacher Examinations,* and satisfactory completion of the prescribed special methods courses.

Prescribed academic courses vary in number in accordance with the scope and complexity of the teaching field and the license requirements of the various

* Special field examinations of the National Teacher Examinations are available in elementary education; early childhood education, biology and general science, English language and literature, industrial arts; mathematics; chemistry, physics, and general science; foreign language; music education; home economics; and art education.

Students preparing to teach history or geography take the special field examination in social studies.

Students preparing to teach in fields in which special field examinations are not available (language and speech) must obtain a satisfactory score on a special field examination given by the instructor in the special methods course involved.

states. Minimum academic course requirements for each major teaching field are listed on succeeding pages. Minor teaching-field requirements are somewhat less than those of a major field. They are determined in conference with an adviser. Students preparing to teach on the elementary level are advised to use free electives to increase their mastery of content in an academic field or an area of specialization, e.g.—Physical Education, etc.

The prescribed course in special methods is concerned primarily with methods of initiating, guiding, and evaluating learning experiences dealing with the content of the teaching field. It attempts to bring to the student specific suggestions drawn from the accumulated experience of successful teachers. However, in addition, the course reviews the teaching-field content currently in use in schools and the examination at the end of the course provides the final test of competency in the teaching field.

Prescribed Courses in the Various Teaching Fields

	Semester Hours
ART	
Six semester hours from the following	6
Art 1: Art Appreciation	
Art 31–32: Survey of Western Art	
Art 71–72: Introduction to the Arts in America	
Art 101–2: Ancient Art	
Art 103: Medieval Art	
Art 104: Renaissance Art in Italy I	
Art 107: Eighteenth Century Art in Europe	
Art 109: Nineteenth Century Art in Europe	
Art 110: Contemporary Art	
Art 113: Baroque Art in Italy	6
Art 114: Baroque Art in the North	
Six Semester hours from the following	
Art 105: Renaissance Art in Italy II	
Art 106: Renaissance Art in the North	
Art 111: Classical Archeology	
Art 112: Art of Egypt and the Ancient Orient	
Art 115: Christian Iconography	
Art 120: Art of China and Japan	24
Art 203: Primitive Art	
Art 207: Modern Architecture	
Twenty-four semester hours from the following	
Art 21–22: Basic Composition and Techniques	
Art 41–42: Drawing and Perspective	
Art 65–66: Drawing and Painting I—Life, Still Life, and Portrait	
Art 81–82: Sculpture I	
Art 125–26: Drawing and Painting II—Life, Still Life, and Portait	
Art 127–28: Drawing and Painting II—Life and Portrait	
Art 157–58: Print Making	
Art 165–66: Drawing and Painting II—Life and Portrait	
Art 175–76: Advanced Composition	
Art 179–80: Sculpture II	36
Art 183–84: Commercial Art	
Total	8
BIOLOGY	
Biology 1–2*: Introductory Biology	3 or 6
Botany or Zoology 127*: Genetics (3) or	
Botany or Zoology 107–8*: Organic Evolution (6)	

* An interdepartmental course offered by the departments of Botany and Zoology. The student may register in either department.

	Hours Semester
Botany: (Advanced courses as approved by the adviser)	6
Chemistry 11–12: General Chemistry	8
Physiology 115: Introduction to Human Physiology	3
Physics 11, 12: Introductory Physics	6
Zoology 101–2: Invertebrate Zoology	6
Zoology 103–4: Comparative Vertebrate Anatomy	6
Total	50

BUSINESS EDUCATION

Accounting 1: Introductory Accounting	3
Economics 1–2: Principles of Economics	6
Secretarial Studies 51: Business Correspondence	3
Additional courses, as prescribed, in *one* of the following groups:	
Group 1—Secretarial Studies*	
Secretarial Studies 2: Intermediate Typewriting	3
Secretarial Studies 12: Intermediate Shorthand and Transcription	3
Secretarial Studies 15: Advanced Shorthand, Typewriting, and Transcription	3
Secretarial Studies 54: Secretarial Practice	3
†Additional courses from the following, as approved by the adviser	6
Accounting 2: Introductory Accounting	
Business Administration 101: Introduction to Business	
Business Administration 109: Office Management	
Business Administration 141: Principles of Marketing	
Business Administration 161: Commercial Law: Contracts, Sales, Agency, and Bailments	
Economics 121: Money and Banking	
Statistics 52: Mathematics of Finance	
Total	30
Group 2—Bookkeeping, Business Arithmetic, and Business Law	
Accounting 2: Introductory Accounting	3
Accounting 111: Financial Statement Analysis or	
Accounting 121: Intermediate Accounting	3
Business Administration 101: Introduction to Business	3
Business Administration 102: Fundamentals of Management	3
Business Administration 161: Commercial Law: Contracts, Sales, Agency, and Bailments	3
Business Administration 162: Commercial Law: Negotiable Instruments, Property, Mortgages	3
Statistics 52: Mathematics of Finance	3
†Three semester hours from the following, as approved by the adviser	3
Business Administration 121: Risk Management	
Business Administration 131: Business Finance	
Business Administration 138: Investments	
Economics 121: Money and Banking	
Total	36
Group 3—Distributive Education	
Business Administration 141: Principles of Marketing	3
Business Administration 142: Marketing Management Problems	3
Business Administration 145: Sales Management	3
†Twelve semester hours from the following, as approved by the adviser	12
Business Administration 147: Advertising	

* Candidates inadequately prepared for Secretarial Studies 2 or 12 may be required to take Secretarial Studies 1 or 11. In such cases, with the approval of the adviser, credit earned for Secretarial Studies 1 or 11 may be substituted for a teaching field elective.

† Not required for the minor teaching field.

	Semester Hours
Business Administration 150: Procurement and Materials Management	
Business Administration 158: Traffic Management	
Business Administration 175: Introduction to Foreign Trade	
Business Administration 176: Exporting and Importing	3
Total	

CHEMISTRY

Chemistry 11–12: General Chemistry	8
Chemistry 21: Qualitative Inorganic Analysis	4
Chemistry 22: Quantitative Inorganic Analysis I	4
Chemistry 151–52: Organic Chemistry	8
Chemistry 191: History of Chemistry	2
Mathematics 6: Plane Trigonometry	3
Mathematics 21: Calculus I	3
Physics 11, 12, 13: Introductory Physics	9
Total	41

ELEMENTARY EDUCATION

Education 113: Elementary School Art	3
Education 114: Elementary School Music	3
Geography 51, 52: Introduction to Geography, World Regions	6
History 71–72: Development of the Civilization of the United States	6
Mathematics 9: General Mathematics I	3
Mathematics 10: General Mathematics II	3
Physical Education 101: Physical Education in Elementary School	9–12
Science, as approved by adviser	6
Six semester hours from the following, as approved by the adviser	
Economics 1–2: Principles of Economics	
History 39–40: Development of European Civilization	
Political Science 9–10: Government of the United States	
Religion 59–60: History of Religion	
Anthropology 1: Man, Culture, and Society I	
Sociology 2: Man, Culture, and Society II	42–45
Total	

ENGLISH

English 1 or 1X, 2: English Composition	6
English 52: Introduction to English Literature	3
English 71–72: Introduction to American Literature	6
English 125: Introduction to English Linguistics	3
English 135–36: Shakespeare	6
Speech 11: Voice and Diction	3
*Nine semester hours from the following, as approved by the adviser	9
English 109: Expository Writing	
English 151–52: The Romantic Movement	
English 161–62: Victorian Literature	
English 165–66: The Twentieth Century	
English 170: The American Short Story	
English 171–72: Studies in American Literature	
English 173–74: Major American Poets	
English 175–76: American Drama	
English 177–78: American Fiction	

* Not required for the minor teaching field.

	Semester Hours
English 182: The English Novel English 183–84: The English Drama	
Total	36

FRENCH

French 1–2: First-year French	6
French 3–4: Second-year French	6
French 9–10: French Conversation and Composition	6
French 51–52: Survey of French Literature and Civilization	6
French 109–10: Advanced French Conversation and Composition	6
*Additional courses in French, as approved by the adviser	6
Total	36

GENERAL SCIENCE†

Biology 1–2‡	8
Chemistry 11–12: General Chemistry	8
Chemistry 21: Qualitative Inorganic Analysis	3
Physics 11, 12, 13: Introductory Physics	9
Physics 16: General Physics	3
Nine semester hours from the following	9
Mathematics 3: College Algebra	
Mathematics 6: Plane Trigonometry	
Mathematics 21, 22, 23, 24: Calculus I, II, III, IV	
Total	41

GEOGRAPHY

Geography 51: Introduction to Geography	3
Geography 52: World Regions	3
Geography 103–4: Cartography	6
Geography 115–16: Physical Geography	6
Geography 145: World Cultural Geography	3
Geography 146: World Political Geography	3
*Six semester hours from the following	6
Geography 183: Western Europe	
Geography 184: The Mediterranean	
Geography 191: Latin America	
Geography 195: Eastern and Southeastern Asia	
Geography 197: The Pacific	
Geography 198: Australia	
*Six semester hours from the following	6
Geography 125: Transportation Complexes	
Geography 126: World Economics	
Geography 133: Regional Industrial Structures	
Geography 134: Location of Industry	
Geography 145: World Cultural Geography	
Geography 146: World Political Geography	
Total	36

GERMAN

German 1–2: First-year German	6
German 3–4: Second-year German	6

* Not required for the minor.
† May not be chosen as a minor field.
‡ An interdepartmental course offered by the departments of Botany and Zoology. The student may register in either department.

	Semester Hours
German 9–10: German Conversation and Composition	6
German 51–52: Introduction to German Literature	6
*Additional courses in German, as approved by the adviser	12
Total	36

HISTORY

History 39–40: The Development of European Civilization	6
History 71–72: The Development of the Civilization of the United States	6
Six semester hours from three of the following groups, as approved by the adviser	18
Group 1—American History	
History 170: American Colonial History	
History 171–72: Social History of the United States	
History 173: Representative Americans	
History 174: Economic History of the United States	
History 175–76: Political and Constitutional History of the United States	
History 181–82: Diplomatic History of the United States	
History 183: Oversea Expansion of the United States	
Group 2—European History	
History 109–10: Ancient History	
History 111–12: Medieval History	
History 130: Nationalism	
History 131–32: History of Germany	
History 141–42: History of France	
History 143: History of Old Russia	
History 147: Economic History of Europe	
History 149–50: European Diplomatic History	
History 151–52: English History	
Group 3—The Eastern World	
History 143: History of Old Russia	
History 145–46: History of New Russia	
History 190: History of India	
History 193: History of the Near East	
History 195–96: History of the Far East	
Group 4—Latin American History	
History 163: Colonial Latin America	
History 164: South America since Independence	
History 166: Mexico and the Caribbean since Independence	
Political Science 177: Recent Trends in Latin American Politics and Government	
Political Science 178: International Politics in the Western Hemisphere	6
*Additional semester hours from one of the foregoing groups, as approved by the adviser	6
Research Seminar (see adviser—Department of History)	42
Total	

MATHEMATICS

Mathematics 3: College Algebra	3
Mathematics 6: Plane Trigonometry	3
Mathematics 21, 22, 23, 24: Calculus I, II, III, IV	12
*Mathematics 101: Introduction to Mathematical Logic	3
*Mathematics 122: Introduction to Abstract Algebra	3
*Mathematics 139: Advanced Calculus I	3
*An additional course in Mathematics, as approved by the adviser	3
Total	30

* Not required for the minor teaching field.

PHYSICAL EDUCATION*

	Semester Hours
Biology 1–2†: Introductory Biology	8
Physiology (as approved by the adviser)	3
Physical Education 43–44: Techniques of Physical Education Motor Activities	4
Physical Education 49: Human Anatomy	3
Physical Education 50: Kinesiology	3
Physical Education 51–52‡ (women): Teaching Physical Education Activities or Physical Education 115–16‡ (men): Teaching Team Sports in Secondary Schools	4
Physical Education 107: Teaching Recreational Dance	1
Physical Education 113–14§: Practice in Teaching Physical Educational Activities	4
Physical Education 117‡ (women): Teaching Modern Dance	1
Physical Education 122: Methods and Materials for Health Education	3
Physical Education 138‡: Organization and Administration of Physical Education	3
Total	36–37

PHYSICS

Physics 11: Introductory Physics	3
Physics 14, 15, and 16: General Physics	9
Physics 101: Mechanics	3
Physics 105: Principles of Electricity	3
Physics 106: Optics	3
†Chemistry Elective—Chemistry 11–12: General Chemistry or Chemistry 12 and 21: General Chemistry and Qualitative Inorganic Analysis	8
Mathematics 21, 22, 23, 24: Calculus I, II, III, IV	12
‡Six semester hours from the following	6
Physics 102: Heat and Thermodynamics	
Physics 113: Atomic Physics	
Physics 114: Statistical Physics	
Physics 128: Sound	
Physics 132: Electronics	
Physics 155: Advanced Laboratory in Electricity and Magnetism	
Physics 156: Advanced Laboratory in Optics	
Total	47

RUSSIAN¶

Russian 1–2: First-year Russian	6
Russian 3–4: Second-year Russian	6
Russian 9–10: Russian Conversation	6
Additional courses chosen from the following with permission of the adviser	6
Russian 91–92: Introduction to Slavic Literature	
Russian 101–2: Rapid Readings in Russian	
Russian 141–42: Russian Literature of the 19th Century	
Russian 151–52: Russian Literature of the 20th Century	
Total	24

* May be chosen as a minor field only, for Bachelor of Arts in Education. See page 7 for requirements for the Bachelor of Science in Physical Education.

† An interdepartmental course offered by the departments of Botany and Zoology. The student may register in either department.

‡ Required only of those preparing to teach on the secondary school level.

§ Required only of those preparing to teach on the elementary school level.

¶ Not required for the minor teaching field.

‖ May be chosen as a minor teaching field only.

	Semester Hours
SOCIAL STUDIES	
History 39–40: The Development of European Civilization	6
History 71–72: The Development of the Civilization of the United States	6
Political Science 9–10: Government of the United States	6
Twelve semester hours from the following	12
Economics 1–2: Principles of Economics	
Geography 51, 52: Introduction to Geography; World Regions	
Religion 59–60: History of Religion	
Anthropology 1: Man, Culture, and Society I	
Sociology 2: Man, Culture, and Society II	
*Additional second-group courses, as approved by the adviser, from one of the following fields, Economics, Geography, History, Political Science, Religion, Sociology and Anthropology	12
Total	42
SPANISH	
Spanish 1–2: First-year Spanish	6
Spanish 3–4: Second-year Spanish	6
Spanish 9–10: Spanish Conversation and Composition	6
Spanish 51–52: Survey of Spanish Literature and Civilization	6
Spanish 109–10: Advanced Spanish Conversation and Composition	6
*Additional courses, as approved by the adviser	30
Total	60
SPEECH	
Speech 1: Effective Speaking	3
Speech 2: Persuasive Speaking	3
Speech 11: Voice and Diction	3
Speech 32: Oral Reading	3
Speech 101: Voice and Phonetics	3
Speech 121: Group Discussion and Conference Leadership	3
Speech 153: Acting	3
Speech 171: Introduction to Speech Correction	3
One of the following areas of specialization, as approved by the adviser:	12
†Group 1—Speech Arts	
Twelve semester hours from the following	
Speech 102: Oral Interpretation of Literature	
Speech 126: Public Discussion and Debate	
Speech 154: Play Production	
Speech 166: History of the Theater	
Speech 169: Creative Dramatics	
Speech 170: Children's Theater	12
†Group 2—Speech Correction	
Twelve semester hours from the following	
Speech 173–74: Speech Therapy	
Speech 176: Speech Correction	
Speech 177–78: Clinical Practice in Speech Therapy	
Speech 182: Hearing Problems and the Testing of Hearing	
Speech 183–84: Clinical Practice in Hearing Therapy	
Additional courses in English, Physiology, Psychology, or Speech, as approved by the adviser	30
Total	60

* Not required for the minor teaching field.
† Not required for the minor.

Professional Education

The basic professional information, skills, and attitudes needed by beginning teachers are provided through a sequence of courses to be taken in the junior and senior years. Lectures and class discussions are closely coordinated with field work. Instruction is differentiated to meet the needs of those preparing to teach on the various levels—elementary school, junior high school, senior high school, and adult.

PROFESSIONAL COURSES—SECONDARY	Semester Hours
Education 108: Human Development, Learning, and Teaching	3
Education 112: Educational Measurements or Statistics 104: Statistics in Psychology and Education I	3
Education 123: Society and the School	3
Education 131: Principles and Methods of Secondary School Teaching	3
Education 134: Student Teaching in Secondary Schools	6–9
Three to six semester hours from the following Special Methods courses	3–6
Education 136: Teaching English	
Education 137: Teaching Speech	
Education 138: Teaching Social Studies	
Education 140: Teaching Mathematics	
Education 144: Teaching Science	
Education 146: Teaching Foreign Languages	
Education 148: Teaching Home Economics	
Education 150: Teaching Business Subjects	
Total	21–27

PROFESSIONAL COURSES—ELEMENTARY	
Education 108: Human Development, Learning, and Teaching	3
Education 111: Methods in Elementary Education	6–12
Education 112: Educational Measurement or Statistics 104: Statistics in Psychology and Education I	3
Education 123: Society and the School	3
Education 135: Student Teaching in Elementary Schools	9
Total	30

Human Development, Learning, and Teaching.—Students enrolled in the four-year programs leading to the degree of Bachelor of Arts take this course in the junior year. Those enrolled in five-year programs take it in the fourth year.

This course attempts to promote a functional understanding of the nature of human growth, development, and learning, illustrated by observation of children in learning situations; the nature of teaching based on principles of human growth, development, and learning, illustrated by observation of school situations. At least an equal amount of time is spent in observation and study of the application of these characteristics and principles to classroom situations. Class discussion normally revolves around these field experiences.

The course is also intended to provide the student with exploratory experiences of assistance to him in deciding whether to choose the profession of teaching. The student's performance in connection with the course is one of the factors considered when the Faculty reviews the list of candidates who have completed the first semester of the junior year (fourth year for those enrolled in five-year programs).

Society and the School.—This course is also taken in the junior year by candidates enrolled in four-year programs (fourth year by those in five-year programs).

The course attempts to promote an understanding and appreciation of the role of schools in the sound promotion of the enduring interests of our democratic society. More particularly, it attempts to develop a functional understanding of the contributions of all social agencies in the education of people and of desirable cooperative working relations that help the school to play its part as a member of the institutional "team" of the community.

The course is also concerned with study of the school as a whole—its purposes, program of studies, out-of-class activities, general organization, and major instructional problems. Although schools at all levels are studied, students give particular attention to schools at the level within which they are preparing to teach.

Classes meet for lecture and discussion for one two-hour meeting each week. At least an equal amount of time is spent in field study. During the course each student studies cooperating social institutions. Extended study of schools at the level of the student's special interest is supplemented by briefer studies of schools at other levels. Class discussion is largely determined by field experiences.

This course is also intended to provide the student with exploratory experiences of guidance value. The performance of the student in the first half of the course is also given careful consideration by the Faculty in its review of the list of candidates at the beginning of the second semester of the junior year (fourth year for those enrolled in five-year programs).

Principles and Methods of Secondary School Teaching.—Those enrolled in four-year programs take this course in the senior year. Those enrolled in five-year programs take it in the fifth year.

The course is concerned with the skills needed by teachers in connection with classroom management, teaching techniques, homeroom procedures, administrative routines, activity sponsorship, group planning, and public relations.

Classes meet for two one-hour meetings each week for lecture and discussion. At least an equal amount of time is spent in field study.

Special Methods Courses in Secondary Schools.—Associated with each teaching field is a course dealing with its special teaching problems. In addition to the study of practices followed by successful teachers, actual teaching content as found in current texts and courses of study is reviewed. Needed content, not included in academic courses available for teaching-field preparation, is taught in these courses.

Student Teaching in Secondary Schools.—This course is taken in the senior year by students enrolled in four-year programs (in the fifth year by those in five-year programs).

It begins with the observation of classroom teaching in selected situations. Assumption of responsibility for teaching functions is gradual, leading eventually to practice in the complete direction of classroom activities. Those preparing to teach in secondary schools have the opportunity of observing and doing practice teaching in both major and minor teaching fields on the senior high school level. The course is directed by full-time members of the Faculty of the School of Education. The work of each student is under the direct supervision of a critic teacher, selected because of unusual success in teaching, ability to supervise, and broad understanding of educational problems. Critic teachers are part-time members of the instructional staff of the School. Student teaching is done in the public schools of the metropolitan area of Washington, assuring practice in situations comparable to those the student is likely to face on becoming a teacher.

Methods in Elementary Education.—Those enrolled in four-year programs take this course in the fall semester of the senior year. Those enrolled in five-year programs take it in the fall semester of the fifth year.

The course offers an integrated approach to general and special methods of instruction in elementary schools. It includes discussion of general skills needed in classroom management, administrative duties, group planning, and public relations. Special techniques of instruction include those needed in teaching arithmetic; science; social studies; and the language arts (reading, literature for children, oral and written expression, spelling, and handwriting). The planning of units of work and the evaluation of pupil progress are also discussed.

Students are required to devote each morning to the prescribed activities of this course. Three mornings a week (9:00–12:00 A.M.) are normally devoted to lectures and discussions by three staff members of the Department of Education. Two mornings a week are spent in observation of and participation in classroom instruction in cooperating public schools of the Metropolitan Area.

Educational Measurement.—Those enrolled in four-year programs usually take this course in the senior year. Those enrolled in five-year programs take it in the fifth year.

The course is concerned with ways of discovering and appraising student needs, the selection of pertinent tests, the construction of teacher-made objective and essay-type tests, and the interpretation of test results for guidance purposes.

The course meets for two hours once a week for classroom instruction. Out-of-class assignments include practice in the construction, administration, and scoring of tests.

Student Teaching in Elementary Schools.—This course is taken in the senior year by students enrolled in four-year programs and in the fifth year by those enrolled in five-year programs.

Students who have not had previous teaching experience are normally assigned to student teaching for a period of twelve weeks. At the request of the student, this assignment may be divided between two different grade levels. An attempt is made to arrange a student-teaching placement in a school system within the Metropolitan Area of Washington and at the grade levels most appropriate in view of ultimate employment aims. Guidance is provided as the student learns to assume responsibility for the major teaching activities.

Students are not asked to take complete charge of a class at the beginning of the student-teaching period. Assumption of full responsibility for teaching activities is gradual and is preceded by an initial period of guided participation and instruction. Toward the end of his assignment the student teacher takes full charge of the class for a considerable period.

Each student is supervised by a member of the Faculty of the School of Education. A cooperating teacher, chosen for proven teaching ability and the capacity to carry on a satisfactory supervisory relationship, is in direct charge of the student-teaching experience.

Special Curricula in Elementary Education

Students preparing for elementary school teaching may also qualify as teachers of French, Spanish, remedial speech, and physical education. Programs should be planned in conference with an adviser.

Attitudes Needed for Success in Teaching

The development of attitudes that motivate professional behavior consistent with the nature of the learning-teaching process is basic to success in teaching. Among the most important of these attitudes are: appreciation of the role of learning in human improvement, respect for intellectual proficiency and true scholarship, objective thinking, and a sense of mission as a member of an important profession.

The responsibility for developing and strengthening attitudes favorable to success in teaching is shared by all parts of the program of teacher education. General education provides a foundation of information essential to an understanding of the course of human events, skills that promote effective social intercourse, the bases of perspective, and an appreciation of cultural development. Teaching-field preparation stimulates intellectual curiosity and respect for objective scholarship in contrast to rationalization. Professional education is organized in a sequence of learning activities primarily based upon the results of research concerning the ways in which the learner grows and develops.

To help students understand the role of education in society and human development and, thus, strengthen a sense of mission and pride in becoming members of the teaching profession, professional courses are closely related to field experiences, and students are encouraged to discuss freely varying viewpoints concerning goals and the interpretation of research data.

Since individual needs in the development of attitudes vary widely, students are encouraged to confer frequently with staff members. Conference hours are designated for this purpose.

FIVE-YEAR PROGRAMS LEADING TO THE DEGREES OF BACHELOR OF ARTS AND MASTER OF ARTS IN EDUCATION

Five-year programs are designed: to permit more adequate teaching-field and professional preparation, to prepare for special teaching positions, and to meet teaching-certificate requirements based upon five years of preparation.

Students in these programs usually devote the third year to additional teaching-field preparation and general education. Ordinarily, teaching-field preparation is continued in the fourth year and the first two professional courses (Education 108 and 123) are taken. The work of the fifth year includes the remaining undergraduate professional courses and the balance of graduate courses needed to meet the requirements of the degree of Master of Arts.

Candidates must have a quality-point index of at least 2.50 before beginning the work of the fourth year. As much as 18 semester hours of the work of the fourth year may be taken for graduate credit. Student Teaching in Secondary Schools, and Student Teaching in Elementary Schools taken in the fifth year, may not be taken for graduate credit.

Candidates enrolled in five-year programs on the secondary school level are able to prepare more adequately in their major or minor teaching fields, or in both. Additional teaching-field courses must be approved by the adviser in the teaching field concerned.

The five-year plan of study also provides an opportunity for candidates to prepare to teach "common learnings" courses in one or more of the various core curriculum plans now found in many secondary schools. Such programs need to be carefully planned to meet the demands of the situation in which the candidate hopes to teach.

A number of cities and some states require five years of satisfactory preparation before issuing certain teaching certificates. Candidates seeking such certificates should familiarize themselves with the requirements of the school system or state concerned and plan their programs accordingly.

Candidates enrolled in five-year programs on the elementary school level are able, in addition to preparation as regular classroom teachers, to prepare for special positions such as: teacher of a foreign language, specialist in remedial speech, specialist in remedial reading, and itinerant teacher of Physical Education.

Five-year programs must meet all the requirements of the degrees of Bachelor of Arts and Master of Arts in Education, and must be approved by the adviser designated for these programs.

THE DEGREE OF MASTER OF ARTS IN EDUCATION

Programs of study leading to the degree of Master of Arts in Education are designed to enable prospective teachers and teachers of experience to increase their knowledge of professional and academic information and skills, prepare for special types of educational service, and provide opportunities for graduates of liberal arts or other nonteacher education institutions to acquire needed professional education.

From the various related departments of the University, the student and his adviser select courses to give the student an adequate background in his chosen field of service. The prospective high school or junior high school teacher will ordinarily include study in the subject which he is planning to teach as well as in professional education.

Programs for teachers-in-service and experienced teachers planning to re-enter the profession are differentiated from those for students without teaching experience. Additional information concerning these programs may be obtained by writing or telephoning to the Dean.

Graduate programs of study are available in the following fields: (1) adult education, (2) classroom teaching—to include strengthening mastery of teaching field, (3) comparative education, (4) curriculum, (5) elementary education, (6) employee training, (7) guidance, (8) history of education, (9) philosophy of education, (10) reading, (11) school administration—secondary or elementary school principalship, and (12) secondary education.

ADMISSION TO CANDIDACY

To be admitted to candidacy for the degree of Master of Arts in Education the applicant must (1) hold a Bachelor's degree from an accredited institution, (2) have an undergraduate quality-point index of 2.50 or above (*C*+ average), (3) have demonstrated a genuine interest in teaching, and (4) have personality traits that give promise of better than average success as a teacher. Those wishing to prepare for careers in guidance or administration must have had at least two years of successful teaching experience. Candidates whose undergraduate preparation does not include equivalents of the basic requirements of the Bachelor of Arts in Education must make up deficiencies.

Advanced Standing

For the record, advanced standing is granted for approved courses taken at other accredited institutions, but a minimum of 30 semester hours must be completed at this University as a matriculated candidate for the degree.

Advanced courses completed in this University in excess of the requirements for the Bachelor's degree may be credited toward the Master's degree to the extent of 12 semester hours, if the work fits in with the student's plan of specialization and is approved in writing by the Dean before being undertaken.

Advanced standing is not granted for work completed three or more years before application for admission or readmission to Master's candidacy.

REQUIREMENTS FOR THE DEGREE

Plan of Study

The plan of study leading to the degree of Master of Arts in Education requires a minimum of 33 hours of graduate credit. The plan may, at the student's option, include a thesis carrying 6 hours of graduate credit. Whether or not a student selects the thesis option, a minimum of 18 hours, including a course in educational research methods and procedures, must be from courses planned primarily for graduate students (third group courses). A minimum of 12 hours, not including the thesis or the research course must be from courses offered by the Department of Education.

Programs may include additional teaching-field preparation. In such cases, however, undergraduate and graduate courses combined must be at least equivalent to the undergraduate requirements for the degree of Bachelor of Arts in Education (see pages 11–24).

Programs are planned initially in conference with an admissions adviser in the Office of the School of Education and subsequently with a designated adviser in the candidate's area of specialization. They take into consideration the interest of the candidate, the previous background, certification requirements of the state and locality in which he plans to teach.

All degree requirements must be completed within a period of six years after admission to study.

Residence

Candidates for the degree of Master of Arts in Education must complete satisfactorily at this University, as matriculated candidates in the School of Education, a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in the Off-Campus Division of the College of General Studies.

The Thesis

If a candidate selects the thesis option, the thesis must conform to standards prescribed. A statement of these standards may be obtained at the Office of the Dean.

The thesis subject must be approved in writing by the candidate's adviser and filed in the Office of the Dean by the date announced in the Calendar. The thesis in its final form must be presented to the Dean no later than the date announced in the Calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 39) are available in the Office of the Dean.

Payment of tuition for the thesis will entitle the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of

the thesis extends beyond the two-year period it must be registered for again and tuition paid on the same basis as for a repeated course.

Comprehensive Examination

In addition to the course examinations, the candidate must pass a comprehensive examination in two parts: (1) a general three-hour examination concerned with an integrated understanding of the foundations of professional education, and (2) a special three-hour examination concerned with the candidate's area of specialization.

THE ADVANCED PROFESSIONAL CERTIFICATE

This program is designed to prepare teachers for more effective service in their chosen fields and to enable them to qualify for a higher step in the local salary scale.

The program of studies leading to the Certificate is selected by the candidate and his adviser from the various related departments of the University in accordance with the student's needs. In general it includes 30 hours of graduate credit beyond the Master's degree. The candidate wishing to increase his teaching proficiency may include additional study in his teaching field.

ADMISSION TO CANDIDACY

The requirements for admission to candidacy for the Advanced Professional Certificate are (1) the degree of Bachelor of Arts in Education or Bachelor of Science in Physical Education from this University, or the equivalent from another institution of higher learning; (2) a Master's degree from an accredited institution of higher learning; (3) at least two years of successful teaching experience; and (4) a permanent teaching license. The applicant who is unable to meet the admission requirements may be admitted with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education.

Advanced Standing and Transfer of Credit

Advanced standing is granted for appropriate graduate work completed in other accredited higher institutions. However, a minimum of 18 semester hours must be completed at this University as a matriculated candidate in the School of Education. The candidate is encouraged to include in his program study at other accredited higher institutions when such study seems to be in his best interest. Advanced standing is not granted for work completed three or more years before application for admission or readmission.

REQUIREMENTS FOR THE CERTIFICATE

Plans of Study

In planning his program the candidate should give first consideration to his particular needs. If his study for the Master's degree was largely in professional education, he may need courses in his teaching field. If his Master's preparation was in a content field, he may need professional study.

The program must include, in addition to any prerequisites, a minimum of 30 hours of graduate credit, 24 hours of which must be in third-group courses (or the equivalent at other institutions). A maximum of 6 semester hours of graduate credit

in second-group courses may be included, a minimum of 12 hours in courses offered by the School of Education must be included.

Residence

Candidates for the Advanced Professional Certificate must complete satisfactorily at this University a minimum of 18 semester hours in courses offered on the campus. The balance of the program may include courses in the Off-Campus Division of the College of General Studies or in other approved institutions of higher learning. The candidate is not required to pursue his program of study continuously. On request, a leave of absence is granted for a period not to exceed three years.

THE DEGREE OF DOCTOR OF EDUCATION

The School of Education offers programs of advanced study leading to the degree of Doctor of Education. These programs are under the supervision of the Committee on Graduate Studies and provide opportunities for study leading to the following professional objectives: school superintendent, secondary school principal, elementary school principal, supervisor, director of guidance, director of curriculum development, professor of education, and specialist in educational research, employee training, or adult education. All programs require study of interrelated areas of education as well as a doctoral dissertation in the major field of study.

Each program is divided into two parts. The first consists of preparation for and the passing of comprehensive examinations in each of four supporting fields and a major field of study. The second is composed of research investigation and the writing of a dissertation in the major field of interest and culminates in the final oral examination.

Admission

The applicant must possess adequate preparation for advanced study including graduate work in fields prerequisite to his objective equivalent to that required for the degree of Master of Arts in Education at this University, at least three years of successful pertinent educational experience, acceptable personal qualities, and a capacity for creative scholarship and effective leadership.

The applicant first arranges for a preliminary interview with the Assistant Dean for Advanced Graduate Studies to explore his needs in relation to the resources of the School of Education and to provide the guidance needed to proceed with an application for advanced study.

To be admitted to graduate study for the degree, the applicant must be accepted by the Committee on Graduate Studies on the basis of the following factors: (1) his previous scholastic and professional record, (2) the results of prescribed admission tests including the Aptitude Test of the Graduate Record Examination, (3) individual evaluation through personal conferences with at least three faculty members including the major professor under whom the applicant desires to pursue his work, and (4) the outcome of a group interview with the Committee on Graduate Studies.

Committee on Graduate Studies

The responsibility for selection of supporting and major fields rests with the candidate. Each applicant when he appears before the Committee on Graduate Studies should be prepared to present an outline of his plan of study including the selection of major and supporting fields and the tools of investigation needed for the comple-

tion of a doctoral dissertation. The tools may include one foreign language or more, statistical methods, or historical criticism. Candidates with less preparation than that normally required for a Bachelor's and Master's degree in Education must make up their deficiencies either prerequisite to or as part of their graduate work.

Study for the Major and Supporting Field Examinations

The requirements for the degree of Doctor of Education cannot be stated in semester hours, but they consist in general of at least two to three years of full-time work, or the equivalent of part-time work, beyond the degree of Master of Arts in Education. Upon admission to study for the first part of a doctoral program the applicant is assigned to a Committee which prescribes and directs his studies. The Committee is composed of professors who will direct the student's work in the major and four supporting fields. Preparation for and the passing of supporting field examinations precedes preparation for and taking the final examination in the major field.

A student is required to consult individually with supporting and major field professors in order to determine the requirements for each field of study and to receive guidance in preparation for each examination. Supporting field examinations are written and are six hours in length. The major field examination is twelve hours in length, six hours on each of two successive days. Upon satisfactory completion of all supporting and major field examinations the student, upon recommendation of the Committee on Graduate Studies, is permitted to pursue the second part of his doctoral program.

The Dissertation and the Final Examination

The student permitted to continue the second part of a doctoral program is assigned to a Master in Research, generally the major field adviser. Throughout the remainder of the program, the candidate is responsible solely to his Master in Research. Two additional faculty members assist the Master in reading the first draft of the candidate's dissertation. When the dissertation is considered acceptable, the Master recommends the candidate to the Dean for the final oral examination.

The final oral examination must be passed at least three weeks before the degree is to be conferred. The examination is conducted by a committee of the Faculty appointed by the Dean, supplemented by at least two leaders in the candidate's field of study from outside the University. The examination is open to the public. Candidates who successfully pass the oral examination are recommended for the degree by the Faculty of the School of Education.

Residence and Continuous Study

All the preparation for the degree must be done in residence. The student must maintain continuous registration in the School of Education, except when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year may result in lapse of candidacy. Subsequent readmission is subject to whatever new conditions and regulations have been established by the Committee on Graduate Studies.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the minor and supporting field examinations or as a candidate engaged in doctoral research. The supporting and major field examinations, however, must be completed within five years of the date of admission and the entire program must be completed within eight years, regardless of full-time or part-time

study. Each candidate is required to complete one semester or more of his program in full-time study. Full-time study in two nine-week Summer Sessions is equivalent to full-time study for one semester.

READING CLINIC

To help children and adults with reading difficulties the University operates a diagnostic and corrective reading clinic. Children may be referred by principals, teachers, or parents. Adults may apply by telephone.

To arrange for a clinical examination of reading status, address The George Washington University Reading Clinic, 2018 I Street NW., or telephone FEderal 8-0250, Extension 491, for an appointment. The Clinic is open for appointments Monday through Friday, from 9:00 A.M. to 5:00 P.M.

Fees.—The fee for individual diagnosis is $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups with common reading difficulties, $3.25 a lesson. All fees are payable in advance at the Office of the Cashier.

SPECIAL CURRICULA

The School of Education provides special curricula for liberal arts graduates, housewives, and retired military personnel who wish to prepare for teaching. Those seeking certification through completion of a program of teacher preparation approved by the National Council for Accreditation of Teacher Education but who do not wish to work for a degree, may enroll in a certification program if they meet the admission, sholarship, and personality requirements of degree candidates. The School also provides a wide range of courses of interest to teachers who wish to renew licenses. See "Application for Admission", below.

ADMISSION

APPLICATION FOR ADMISSION AND READMISSION

Forms for application for admission or readmission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FE 8-0250, extension 344. The application for admission*, with a $10 application fee and a recent, signed photograph, should be returned to the Office of the Director of Admissions.

Application for admission or readmission for degree candidacy, together with all required credentials, should be received by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions to insure consideration. Late applications will be considered only if the application form and all required credentials are received in the Admissions Office no later than two weeks prior to the first day of registration for the semester or session for which application is made. Exceptions may be made under extraordinary circumstances, at the discretion of the Director of Admissions.

An applicant who has attended one or more institutions of higher learning must

* An application for readmission does not require a fee unless it involves transfer to a college, school, or division of the University other than the one in which the applicant was last registered. In this case, a $5 transfer fee is required.

request each registrar to mail directly *to the Office of the Director of Admissions* a transcript of his record, *even though credits were not earned.*

Admission to graduate study.—A student with a Bachelor's degree from this University who wishes to work toward a Master's degree *must* apply, at the Office of the Director of Admissions, for admission to graduate study.

READMISSION

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded), must apply for readmission in the Office of the Director of Admissions. If he applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of the Director of Admissions from each institution attended. Applications for readmission are considered on the basis of regulations currently effective.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees

Bachelor of Arts in Education or *Bachelor of Science in Physical Education.*—The satisfactory completion of the two-year curriculum in Education or Physical Education offered in the lower-division of Columbian College of Arts and Sciences (see pages 8, 10, 11–12), or the equivalent from another accredited higher institution, or a certificate of graduation from an approved normal school or the equivalent is required. The applicant must have a quality-point index of 2.00 (average grade of *C*) counting *Incomplete* grades as *F*. He must have demonstrated a genuine interest in teaching, possess personality traits that give promise of success as a teacher.

Applicants in the Metropolitan Washington Area must have a personal conference with the Assistant Dean of the School of Education in charge of admission or with one of his assistants. Applicants from a distance who are strongly recommended as good teacher prospects by a member of the Faculty of another institution may be admitted without a personal conference.

Applicants who have not completed requirements in the appropriate pre-Education curriculum in Columbian College of Arts and Sciences, or the equivalent at other accredited institutions, may be admitted to the School of Education with deficiencies. Such deficiencies must be removed before graduation and in the sequence prescribed by the student's adviser.

Advanced Standing

An applicant for advanced standing may be considered for admission upon presentation of satisfactory credentials from an accredited institution of higher learning. The student must be in good standing as to scholarship and conduct and must be eligible to return to the previously attended institution in the semester for which he seeks admission to this University. Credit for transferred work will be assigned by the School of Education to the extent that it meets the requirements for the degree sought at this University and subject to the University regulations concerning satisfactory subsequent work.

The applicant who is unable to meet the admission requirements may be admitted

with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education. The applicant seeking to qualify for a higher level in the local salary scale must have his program approved by the appropriate representative of the school system employing him.

REGISTRATION

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions.

A student who has previously matriculated in the University, but who has not been in attendance during the semester prior to registration (summer session excluded) should file an application for readmission in the Office of the Director of Admissions two weeks in advance of registration.

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in this University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration.* Allowance for credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted, effective September 1962:

Tuition Fees

Except work taken by a candidate for a Doctor's degree:	
Full-time program (15 hours or more), a semester	$500.00
Part-time program, for each semester hour	33.00
For the degree of Doctor of Education:	
For work* leading to and including the general examination	1,100.00
For work leading to and including the final examination	1,100.00

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

Graduation Fees

Wherein a degree is conferred	25.00
Wherein an Advanced Professional Certificate is conferred	25.00

* This fee does not cover the cost of tuition for elementary courses (numbered 1–100).

Fee for Binding Master's Thesis	6.00
Fee for Printing Summary of Doctoral Dissertation	85.00

Special Fees

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application fee, charged each applicant for admission to nondegree teacher certificate programs, nonrefundable	10.00
Application fee, charged each applicant for admission to nondegree status, nonrefundable	5.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Admission tests (when required)	6.00–12.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one or more than one course	2.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees")	1.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements	33.00
For special physical examination	2.00
For each examination to qualify for advanced standing and for each special examination	5.00
English tests for foreign students, when required	5.00
Laboratory checkout fee, charged each student in chemistry courses who fails to check out of the laboratory by the time set by the instructor	3.00
Transcript fee, charged for each transcript of record after the first	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described on pages 43–44. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

In exceptional cases, subject to the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day† in November; one-third on the first working day† in December.

* Payable at the time of application for transfer or readmission.
† The University work week is Monday through Friday, inclusive.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of $2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of $5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Fall Semester

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of tuition charges.

Spring Semester

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

A student enrolled in a full-time program, who drops or adds a course and continues to be in a full-time program, will have no financial adjustments of tuition made other than those involving course fees.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration

* The University work week is Monday through Friday, inclusive.

day. In this case a withdrawal fee of $5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of $3. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equipment, and textbooks, on separation from the Corps, will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

REGULATIONS

AMOUNT OF WORK

Fifteen to 17 semester hours of credit constitute a normal program. A student with a quality-point index of 3.00 or higher, may, with the permission of the Dean, enroll for 18 or 19 hours. No student may enroll for more than 19, except by permission of the Committee on Scholarship.

A student employed 15 hours or less a week may carry a normal program of college work.

A student employed from 16 to 25 hours a week may enroll for 12 or 13 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 15 or 16 hours.

A student employed from 26 to 34 hours a week may enroll for 9 or 10 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 12 or 13 hours.

A student employed 35 hours or more a week may enroll for 6 or 7 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 9 or 10 hours.

A student who increases his hours of employment after registration or at any time during a semester must report immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. Regular attendance is required. A student may be dropped from any course for undue absence.

SCHOLARSHIP

A student who fails to maintain the scholarship requirements of the School of Education may be dismissed from the University.

Grades

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors.

Undergraduate.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the dean's council of the college, school, or division concerned. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. A student may not repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

Graduate.—For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete).

The Quality-Point Index

Undergraduate scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete record in this University.

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete is not superseded by a proper grade within the allotted time, it is computed as zero quality points. Grades in courses taken at another institution are not considered in computing the quality-point index.

Academic Dishonesty

Evidence of dishonesty on the part of any student will result in his suspension by the Dean upon recommendation of the Dean's Council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for all courses in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in computation of the quality-point index.

If a student suspended because of academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the quality-point index.

Probation

A student who fails to maintain a quality-point index of at least 2.00 is placed on probation. He remains on probation as long as his index is below 2.00, or until his probation is removed by the Committee on Scholarship.

Suspension

A student on probation who fails to raise his index to 2.00 within the time specified may be suspended. A student who fails one-half or more of the minimum of 16 semester hours may be suspended.

A student suspended for poor scholarship may, within ten days, appeal his case to the Committee on Scholarship through the Dean. If the case appears to be remediable and the student seems likely to improve in his scholarship, the Committee may readmit him on probation. A student denied readmission may again, after the lapse of a calendar year, petition the Committee through the Dean for readmission. A student suspended twice will not be readmitted.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Permission to withdraw from the University will not be granted a student who does not have a clear financial record.

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

CHANGES IN PROGRAM OF STUDIES

Changes within the School.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the Dean, upon presentation of adequate reasons for such changes.

Change from one section to another of the same course may be made with the approval of the Dean and the department concerned.

Change from one major subject to another within the same college or school may be made with the approval of the Dean. All requirements of the course of study to which the change is made must be met.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Application for transfer must be made to the Director of Admissions on the form provided by his office.

Students wishing to transfer from the Division of University Students to the School of Education should note that a maximum of 45 semester hours will be accepted in transfer.

In order to provide degree candidates with proper academic counsel and the benefits of integrated programs of study, the faculties of the various colleges and schools have established minimum residence requirements and regulations with regard to supervision of the work done in the student's major field. In addition, various special regulations regarding course sequence, selection of electives, and advisory approval of programs apply in particular curricula. Students transferring within the University are advised to study carefully the graduation requirements and to note that in all undergraduate divisions 30 semester hours including *at least 12 semester hours* in the major field, must be completed *in residence* in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill.

* The University work week is Monday through Friday, inclusive.

CREDIT

Credit is given only after registration for a course and satisfactory completion of the required work.

On request the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations. A student who takes a course as an auditor may not take the same course later for credit.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the Dean. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

GRADUATION REQUIREMENTS

To be recommended for graduation a student must have met the admission requirements of the college or school in which he is registered, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Students expecting to complete, during the Summer Sessions, requirements for degrees to be awarded at the February convocation, must apply for graduation as a part of registration for the Summer Sessions.

Scholarship.—The undergraduate student must maintain a quality-point index of at least 2.00.

Candidates for the Master's degree and the Advanced Professional Certificate must obtain at least a grade of *Satisfactory* (*B* level) on each course of the required minimum graduate program and must maintain a quality-point index of at least 2.50 on all prerequisite courses.

Curriculum.—Curriculum requirements for the Bachelor's degrees are stated on pages 7–24; for the Master's degree, on pages 24–28.

Residence.—The undergraduate student and the Master's candidate must complete a minimum of one year or 30 semester hours in residence. Not more than 9 hours

of this requirement may be satisfied by off-campus courses. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

Candidates for the Advanced Professional Certificate must meet a minimum residence requirement of 18 semester hours taken on campus.

Degree candidates are expected to maintain continuous residence by registering for at least one course in each of two of the three terms (fall, spring, summer). Candidates who are unable to enroll for a course but wish to use the library facilities and consult staff members may, with the permission of the Dean, register "in residence" by paying the residence fee. Candidates, who for reasons beyond their control, must temporarily discontinue their studies may be granted leave of absence for one or two terms, on petition to the Dean's Council.

Students who complete degree requirements during the Summer Sessions and are cleared for February graduation by the Registrar are not required to register "in residence" for the fall semester.

National Teacher Examinations.—All candidates for the Bachelor of Arts degree in the School of Education are required to take the National Teacher Examinations at one of the regularly scheduled administrations conducted in February, July, and October. Candidates expecting to graduate in June should take the examinations the previous February. Those expecting to graduate in February should take the examinations the previous July or October.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. A copy of test scores must be forwarded to the School of Education.

Each senior required to take the National Teacher Examinations must register for them in the Office of the Dean at least thirty days prior to the date of the administration of the examinations. Details concerning time, place, registration, and fees may be obtained in the Office of the School of Education.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for the Master's or Doctor of Education degrees must be presented in its final form to the Dean no later than the date specified in the Calendar. Three complete copies of each are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis or dissertation, which are rigidly enforced.

Accepted theses and dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the appropriate Dean.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Presence at Graduation.—Presence at the graduation exercises is required of the candidate unless the work for the degree was completed during the summer term or written application for graduation *in absentia* has been approved by the Dean.

Honors

With distinction.—In all undergraduate divisions of the University the degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains

a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded by the Faculty to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.

3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.

4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

Library books, with the exception of those in the Law and Medical collections, may be drawn for home use for a period of two weeks. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books and periodicals for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

Hours

The University Library is open from 9:00 A.M. to 10:00 P.M. each class day (Saturday 9:00 A.M. to 5:00 P.M.), and from 2:00 to 6:00 P.M. on Sunday.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

FELLOWSHIPS, GRADUATE SCHOLARSHIPS, AND ASSISTANTSHIPS

The following fellowships, graduate scholarships, and assistantships are available. Unless otherwise specified, applications should be submitted not later than March 1 preceding the period for which the award is to be made. They should be directed to the chairman of the department or the dean of the school concerned and addressed to The George Washington University, Washington 6, D. C.

University Teaching Fellowships.—Assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to $2,000 plus tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Tuition and laboratory fees may not exceed $500. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the chairman of the department of instruction concerned.

Graduate Teaching Assistantships.—Open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to $2,000 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Tuition and laboratory fees may not exceed $600. Application should be made to the chairman of the department of instruction concerned.

SCHOLARSHIPS AND PRIZES

The following scholarships and prizes are limited to students in the School of Education. The University offers many others which are open to School of Education students. A special bulletin containing a complete list and full information may be obtained from the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded.

Scholarship application should be made in writing on or before April first for the following academic year and, unless otherwise specified, should be addressed to the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C. Awards are made during the month of April. All scholarships begin with the fall semester.

Mildred Green Memorial Scholarship Fund (1959).—Established by Alpha Theta Chapter of Pi Lambda Theta, provides annual tuition aid for a student in the School of Education, upon the recommendation of the donor.

Anna Spicker Hampel Scholarship (1949).—Established by Evelyn Hampel Young in memory of her mother, provides tuition aid for a young married woman in the School of Education or Columbian College of Arts and Sciences.

Elizabeth V. Brown Scholarship Fund (1925).—A Columbian Women Scholarship

memorial fund of $1,200 for tuition aid, established by the College Women's Club of Washington, D. C., and restricted to the School of Education.

Phi Delta Kappa Prize.—Awarded annually by Beta Gamma Chapter to the outstanding senior man in the teacher education program in the School of Education.

Pi Lambda Theta Prize.—Awarded annually by Alpha Theta Chapter to the outstanding senior woman in the teacher education program in the School of Education.

FINANCIAL AID

University Loan Fund.—The Trustees of the University have made available a fund for short-term loans to students to provide for partial payment of tuition. Application should be made three days prior to the dates on which tuition installments are due.

Home Economics Loan Fund.—A fund of $382, given by the D. C. Home Economics Association, is available for loans to senior girls majoring in Home Economics.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a wish to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than July first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

For complete information on other Fellowships, Scholarships, Prizes, Financial Aid, request the Special Bulletin on the subject, which is available in the Office of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

A list of banks and commercial finance firms offering various types of tuition payment plans is available through the Office of the Treasurer.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains seven residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Rooms are leased for the academic year, and a deposit of $50, which is credited toward the fall semester room charge, is required. If notice of withdrawal or cancellation of room reservation is received prior to June 30, $25 of the deposit will be refunded. Room rentals are payable in advance by the semester.

Forms for application, together with detailed information, may be obtained from

the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the residence halls only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to live outside the residence halls except with persons approved by the Director of Activities for Women.

Freshman girls may live outside the residence halls only with their parents or with immediate relatives with the written approval of their parents.

John Quincy Adams Residence Hall for men provides triple rooms with bath. Rooms rent at $345 a person for the academic year.

John C. Calhoun Residence Hall for men provides double rooms at $330 a person for the academic year.

William H. Crawford Residence Hall for women provides double rooms at $405 a person for the academic year.

Hancock Residence Hall for women provides single rooms at $535 and double rooms at $405 a person for the academic year.

Dolly Madison Residence Hall for women provides double rooms at $405 a person for the academic year.

Hattie M. Strong Residence Hall for women provides single rooms at $470 and double rooms at $405 a person for the academic year.

Welling Residence Hall for men provides a limited number of double rooms at $300 a person for the academic year.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, to office or residence (District of Columbia), in any one illness, exclusive of a special-ist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

* A charge of $2 for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

† See Rule 5, for exception.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

HONOR SOCIETIES AND PROFESSIONAL ORGANIZATIONS

Alpha Pi Epsilon.—An honorary Home Economics Sorority whose purposes include the improvement of scholarship and leadership standards among Home Economics students.

Phi Delta Kappa.—An international professional fraternity for men in Education, to promote fellowship based on common interests and ideals which make possible group action for the development of free public education through research, service, and leadership.

Pi Lambda Theta.—A national honorary association for women in Education, dedicated to the conception of education as a profession.

Student National Education Association.—Provides members with opportunities for developing personal and professional competency through an understanding of the history, ethics, and programs of the organized teaching profession.

COURSES OF INSTRUCTION

The University reserves the right to withdraw any course announced.

Explanation of Course Numbers

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the Dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved before the mid-point of the course by the Dean of the School of Education and by the officer of instruction concerned, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the officer of instruction, to qualified seniors.

Indication of the Amount of Credit

The number of semester hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving three hours of credit each semester is marked (3–3), and a semester course giving three hours of credit is marked (3).

DEPARTMENT OF EDUCATION

Courses offered by the Department of Education are of two types: those designed for the preservice education of candidates and those planned for the inservice education of teachers, counselors, and administrators.

Preservice courses devote two or three hours a week to lecture and discussion supplemented by a minimum of two hours a week of related field work. A clinical approach to the study of educational problems is used—lectures and discussions revolving around observed practices.

Inservice courses meet once a week for a two-hour period. Class work is supplemented by extensive reading assignments, the preparation of reports, and field work. A student enrolled in one of these courses should plan to devote not less than seven hours a week, exclusive of class time, to the work of the course.

Ample opportunity is provided to study teaching or administrative problems of special interest. To enable students to consult with instructors regarding individual problems, a conference hour is scheduled immediately before or after the class period.

Only the courses designed to provide professional information and skills are listed below. For courses needed for general education or teaching-field preparation, see the catalogue for the Division of University Students. In addition to courses offered in the Department of Education a number of professional courses for teachers are offered in the departments of Psychology, Speech, and Statistics. These are listed below together with courses offered by the Department of Education.

Whenever possible, the exact hour of class meeting is stated. Hours for classes not yet scheduled may be found in the Schedule of Classes for the semester concerned.

A *Reading Clinic*

Coleman and Staff

Diagnosis of reading difficulties; individual or group lessons without academic credit. Fee: for individual diagnosis, $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups with common reading difficulties, $3.25.

Second Group

108 *Human Development, Learning, and Teaching* (3) Baker, McCauley

(Formerly Education 109–10)

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall and spring—section A: M 1:10–3:10 P.M., section B: F 7:10–9:10 P.M.; summer 1962 (as Education 109–10 (3–3)) (Baker, McCauley, Lang). For the general student as well as the prospective teacher. Principles of effective teaching based on an understanding of human development and the nature of learning. Prerequisite: Psychology 22 or 121.

111 *Methods in Elementary Education* (12) Baker and Staff

Fall—Monday through Friday 9:10–12 A.M. For seniors in the elementary school curriculum. Methods, materials, appraisal, and field experiences in elementary schools. Problems and procedures in teaching the language arts (including reading, literature

for children, oral and written expression, spelling, and handwriting), arithmetic and science, social studies. Planning units of work, general classroom procedures, and evaluation of pupil progress. Observation and participation two mornings a week. Prerequisite: Education 108 and 123.

112 *Educational Measurement* (3) McCauley
Fall—T 3:10–5:10 P.M.; spring—T 7:35–9:35 P.M.; summer 1962 (Cook). Scope, needs, services to students, selection and construction of teacher made tests, interpretation of tests for evidence purposes. Prerequisite: Education 108 and 123.

113 *Elementary School Art* (3) Nowlin
Fall and spring: lecture and laboratory—M 6:10–9 P.M., field work—as arranged; summer 1962 (Crump). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22, or 121. Material fee, $4.50.

114 *Elementary School Music* (3) Reed
Fall and spring—Th 7:30–9:35 P.M., field work (2 hours)—as arranged; summer 1962 (Mitchell). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22, or 121.

115 *Teaching of Reading in the Elementary School** (3) Parker
Spring—W 7:10–9:10 P.M., field work (2 hours)—as arranged; summer 1962. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 108 and 123 or teaching experience.

116 *Elementary School Social Studies** (3) Evans
Fall—F 7:10–9:10 P.M., field work (2 hours)—as arranged; summer 1962 (Cushman). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

117 *Elementary School Science** (3) St. Cyr
Spring—F 6:10–9 P.M., field work (2 hours)—as arranged; summer 1962. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

120 *Elementary School Arithmetic** (3) Scott
Spring—Th 7:35–9:35 P.M., field work (2 hours)—as arranged; summer 1962 (Baker). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

123 *Society and the School* (3) St. Cyr and Staff
(Formerly Education 121–22)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall and spring—section A: W 1:10–3:10 P.M., section B: M 6:10–8:10 P.M.; summer 1962—offered as Education 121-22 (3–3) (St. Cyr, Eller, Scott). For the general student as well as the prospective teacher. Historical and social development of education at local, national, and international levels; cooperation of the school with other community agencies; functions of school personnel.

128 *Children's Literature** (3) Walker
Spring—M 7:10–9:10 P.M., field work (2 hours)—as arranged; summer 1962 (Wilson). For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.

131 *Principles and Methods of Secondary School Teaching* (3) Detwiler, Myers, Stalling
Fall—section A: TTh 12:30–1:45 P.M., section B: MW 4:30–5:45 P.M.; spring—MW 4:30–5:45 P.M. Field work as arranged. For seniors in the secondary school curriculum. Course, unit, and lesson planning; practical techniques used in connection

* This course may not be taken by students who have completed or plan to enroll in Education 111.

with motivation, the assignment, group procedures, directing study, individual differences, evaluation, clerical routines, disciplines, the homeroom, activity sponsorship, public relations. Prerequisite: Education 108 and 123.

134 *Student Teaching in Secondary Schools* (6 to 9) Detwiler and Staff

134A: fall—as arranged; 134A, 134B, 134C, and 134D: spring—as arranged. For seniors in the secondary school curriculum. Sections A and B are for full-time academic majors (Detwiler). Section C is for academic majors in the intensive program (Detwiler). Section D is for physical education majors (Myers, Stallings). Student teaching fee, $50. Admission by permission of the instructor. Prerequisite: Education 108 and 123.

135 *Student Teaching in Elementary Schools* (9) Baker

135A and 135B: spring—as arranged. For seniors in the elementary school curriculum. Student teaching fee, $50. Admission by permission of the instructor. Prerequisite: Education 108 and 123.

Special Methods Courses*

To be elected in the senior year after substantial preparation in the teaching fields concerned by the students in the secondary school curriculum. Course requirements and hours of credit vary with license requirements. Practices of successful teachers are studied and actual teaching content as found in current texts and courses of study is reviewed.

136 *Teaching English* (2 to 4) Lumsden

Spring—M 7:10–9 P.M., field work (2 hours)—as arranged. Prerequisite*: 18 semester hours in English.

137 *Teaching Speech* (2 to 4) Kosh

Spring—T 7:35–9:35 P.M., lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 18 semester hours in Speech or the permission of the instructor.

138 *Teaching Social Studies* (2 to 4)

Spring—Th 7:35–9:35 P.M., field work (2 hours)—as arranged. Prerequisite*: 24 semester hours of social studies

140 *Teaching Mathematics* (2 to 4) Brown

Spring—Th 7:35–9:35 P.M., field work (2 hours)—as arranged. Prerequisite*: Mathematics through calculus.

144 *Teaching Science* (2 to 4) Eller

Spring—T 7:35–9:35 P.M., field work (2 hours)—as arranged. Prerequisite*: 24 to 40 semester hours of science.

146 *Teaching Foreign Languages* (2 to 4) McSpadden

Spring—T 5:10–7 P.M., field work (2 hours)—as arranged. Prerequisite*: 18 semester hours of one foreign language.

148 *Teaching Home Economics* (2 to 4) Towne

Spring—as arranged. Prerequisite*: 30 semester hours of Home Economics.

150 *Teaching Business Subjects* (2 to 4) Shott

Spring—S 9:10–11 A.M. Prerequisite*: 30 semester hours of business education.

Third Group†

203–4 *Comparative Education* (3–3) Jarman

Not offered 1962–63. Comparison of foreign educational systems with those of the United States, particularly those of Russia, West Germany, Denmark, Switzerland, France, the British Isles, Canada, and Australia.

205–6 *The Curriculum*‡ (3–3) St. Cyr

Academic year—S 11:10 A.M.–1:10 P.M. For experienced teachers. *First half:*

* Prerequisite to all special methods courses: Education 108, 123, and 131. Additional prerequisites as stated under each course.

† A degree from an accredited institution is prerequisite to all third-group courses.

‡ Prerequisite: adequate professional preparation.

curriculum foundations and issues; comparison of curriculum patterns. *Second half:* principles and procedures in curriculum development; group consideration of student problems.

St. Cyr

207 *Curriculum Materials** (3)

Summer 1962. For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

Lang

208 *Human Development, Learning, and Teaching* (3)
(Formerly Education 201–2)

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall and spring—M 7:10–9:10 P.M. For graduate students. Principles of effective teaching based on an understanding of human growth and development and the nature of learning. Prerequisite: Psychology 1 and 22, or 121.

McCauley

209 *Child Growth and Development* (3)

Fall—W 7:10–9:10 P.M. An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.

McCauley

210 *Adolescent Growth and Development* (3)

Spring—W 7:10–9:10 P.M. A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.

McCauley

211 *Evaluation in Education** (3)

Fall—Th 7:35–9:35 P.M. Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

McCauley

212 *Educational Measurement* (3)

Spring—Th 7:35–9:35 P.M. Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.

Jarman

213–14 *History of Education* (3–3)

Academic year—T 7:35–9:35 P.M. *First half:* the European backgrounds of American education. *Second half:* the evolution of the American school system.

215 *Education of Exceptional Children** (3)

Fall—Th 7:35–9:35 P.M. For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

216 *Education of Slow-learning Children** (3)

Not offered 1962–63. Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

Jarman

217–18 *Philosophy of Education** (3–3)

Academic year—M 7:10–9:10 P.M.; summer 1962—Education 218 (3) (Darland). *First half:* designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.

Baker

219 *Elementary School Classroom Procedures** (3)

Summer 1962. Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.

* Prerequisite: adequate professional preparation.

223–24 *Reading Problems** (3-3) Coleman
Academic year—W 7:10–9:10 P.M. For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.

225 *Elementary School Reading* (3) Coleman
Summer 1962. For experienced teachers. Developmental and remedial approaches to reading problems. Demonstration of diagnostic and corrective techniques used by the classroom teacher and the reading specialist.

226 *Reading in Secondary Schools* (3) Coleman
Spring—T 7:35–9:35 P.M. For experienced teachers. Consideration of special problems in the content areas; diagnostic and corrective techniques and materials for the classroom teacher; reading improvement programs.

227 *Basic Issues in Elementary Education* (3) Baker
Fall—S 9:10–11:10 A.M. A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.

228 *Instructional Areas in Elementary Education* (3) Baker
Spring—S 9:10–11:10 A.M. Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.

229 *Administration of Elementary Education* (3)
Fall—F 7:10–9:10 P.M.; summer 1962 (Carroll). For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.

231 *Secondary School Classroom Procedures** (3) Giancaspro
Fall—Th 7:35–9:35 P.M.; summer 1962 (Detwiler). Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.

233 *Audio-visual Education** (3) Logan
Spring; lectures (2 hours), laboratory (1 hour)—F 6:30–9:30 P.M.; summer 1962. Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, $7.

241 *Education of the Gifted** (3) Rashid
Spring—W 7:10–9:10 P.M.; summer 1962. For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.

243 *Human Relations in the Classroom** (3) Marinaccio
Summer 1962. Principles and practices involved in interpersonal relationships between learner and teacher and among learners.

245 *School and Community** (3) Angel
Fall and spring—T 7:35–9:35 P.M.; summer 1962. The school as an important member of a team of social agencies that builds the community.

247 *Vocational Education** (3) Walsh
Fall—M 7:10–9:10 P.M. Development in the United States; current conceptions, agencies involved, problems, and trends.

251 *Guidance in Elementary and Secondary Schools** (3) McDaniels
Fall and spring—M 7:10–9:10 P.M.; summer 1962 (Detwiler). A survey course: scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.

* Prerequisite: adequate professional preparation.

252 *Organization and Administration of Guidance Services* (3)
Not offered 1962–63. Designed for guidance directors and supervisors and experienced school counselors who hope to qualify for such positions in the near future. Prerequisite: a minimum of 15 semester hours of approved graduate work in Measurement and Guidance.

253 *Analysis of the Individual for Purposes of Counseling* (3)
(Formerly Psychology 236)
Fall and spring—T 7:35–9:35 P.M.; summer 1962—offered as Psychology 236. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: Education 112 or the equivalent. Root

254 *The Junior High School** (3)
Not offered 1962–63. Purposes, organization, core program, guidance, developing course of study, extra-classroom activities. Root

255–56 *Secondary Education** (3–3)
Academic year—S 9:10–11:10 A.M.; summer 1962 (Root, Giancaspro). *First half:* current proposals for the improvement of secondary education. *Second half:* current problems in each of the subject-matter fields.

257 *Occupational and Educational Information* (3)
(Formerly Psychology 229)
Fall and spring—F 7:10–9:10 P.M. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.

258 *Techniques of Counseling* (3)
(Formerly Psychology 228)
Fall and spring—Th 7:35–9:35 P.M.; summer 1962—offered as Psychology 228. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Education 253 and 257. In exceptional cases Education 253 or 257 may be taken concurrently with 258. Johnson

259–60 *Secondary School Management** (3–3)
Academic year—S 9:30 A.M.–3 P.M. For experienced teachers and administrators with two years of successful teaching in secondary schools. Management planning, execution, and control; criteria of good management, construction of the master schedule; leadership problems incident to the development of new policies and programs.

261–62 *Practicum in Guidance* (3–3)
Academic year—as arranged. Supervised practical instruction in school guidance. Prerequisite: graduate work in counseling. Admission by permission of the Chairman of the department. Root

263–64 *Employee Training* (3–3)
Academic year—W 7:10–9:10 P.M. *First half:* nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half:* administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training. Lumsden

265–66 *Teaching Secondary School English* (3–3)
Not offered 1962–63. A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half:* communication skills—structural linguistics, composition, and speech. *Second half:* American and English literature. Whipple

267–68 *Teaching Secondary School Social Studies* (3–3)
Academic year—W 7:10–9:10 P.M. A refresher course for teachers of the Social studies. Discussion of new approaches to high school content. Offered in coopera-

* Prerequisite: adequate professional preparation.

tion with the departments of History, Political Science, Geography, Economics, and Sociology and Anthropology.

271 *The Teacher and School Administration** (3) Fox
Fall—W 7:10–9:10 P.M.; summer 1962 (Carroll). A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

272 *The Teacher and School Supervision** (3) Fox
Spring—W 7:10–9:10 P.M.; summer 1962. Nature, organization, human relationships, and techniques.

273–74 *Teacher Education** (3–3)
Not offered 1962–63. *First half:* aims, objectives, and basic issues; study of outstanding and experimental programs. *Second half:* recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences.

275 *School Finance** (3) Hutchins
Summer 1962. Educational financial theory, practice, and control, including methods of financing.

276 *Seminar: Public Relations in School Administration** (3) Joy
Not offered 1962–63. Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

277 *Administration of School Personnel** (3) Carroll
Summer 1962. Techniques and problems of administration related to more effective service of staff personnel.

278 *School Law** (3) Remmlein
Summer 1962. Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.

279–80 *Adult Education** (3–3) Detwiler, Holden
Academic year—T 7:35–9:35 P.M.; summer 1962—Education 280 (3) (Detwiler). *First half:* current concepts and objectives, agencies involved, programs on all levels—international through community. *Second half:* the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.

283–84 *Higher Education** (3–3) Jarman
Academic year—Th 7:35–9:35 P.M. *First half:* development, present status, and outlook for American colleges; purposes of higher education, current and projected programs; trends in curriculum, instruction, administration, and evaluation of outcomes. *Second half:* principles in development of college programs; study of curricula in liberal arts and professional fields; relationship of institutional services and facilities to the instructional program.

285 *Extra-classroom Activities** (3)
Not offered 1962–63. Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.

287–88 *Clinical Study of Reading Problems** (3–3) Coleman
Academic year—F 5:10–7 P.M. For advanced students. Diagnostic and corrective work under supervision of the Reading Clinic. Each student is expected to diagnose and treat pupils who are retarded in reading. Case studies are presented and criticized. Prerequisite: Education 223–24 or the equivalent. Material fee, $5 a semester.

289 *Supervisory Problems in Reading** (3) Coleman
Not offered 1962–63. For experienced teachers, principals, supervisors, and superintendents. Considers the problems involved in planning, reorganizing, and improving the total reading program, in promoting cooperative effort on the part of the staff toward increasing teaching efficiency.

* Prerequisite: adequate professional preparation.

291 *Planning the School Plant* (3) Cameron
Not offered 1962–63. Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.

293–94 *Research* (3–3) The Staff
Academic year—as arranged. Individual research under the guidance of a member of the staff. Program and conferences arranged with an instructor.

295 *Educational Research Methods and Procedures* (3)
Fall—M 7:10–9:10 P.M.; spring—Th 7:35–9:35 P.M.; summer 1962. Required of all candidates for graduate degrees in Education. To be taken early in the student's graduate program. Prerequisite: an elementary course in statistics.

296 *Seminar in Educational Research* (3)
Spring—M 7:10–9:10 P.M. Designed to help students analyze scientific approaches to problems in education; evaluate the application of research techniques to typical problems; define, organize, and conduct research studies; and prepare proposals for sponsored research. Required of all candidates for the Doctor of Education degree and open, with permission, to candidates for other advanced degrees. Prerequisite: Education 295 or the equivalent.

297 *Reading in Education* The Staff
Fall and spring—W 5:10–6 P.M.; summer 1962. To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, $33.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged. Required of all Master of Arts candidates writing Master's theses.

DEPARTMENTS OF PHYSICAL EDUCATION

The following courses are offered by the Department of Physical Education for Men and the Department of Physical Education for Women. Whenever possible the departments offer lecture courses jointly.

First Group

43–44 *Techniques of Physical Education Motor Activities* (2–2) DeAngelis, George, Krupa
Academic year—day. Fundamental skills, rules, and organization. Locker and towel fee,* $4.50 a semester.

45–46 *Teaching Individual and Dual Sports in Secondary Schools* (2–2) (men) Hanken, Krupa
Academic year—day. Tennis, golf, swimming, wrestling, badminton, bowling. Locker and towel fee,* $4.50 a semester.

47 *Introduction to Physical Education* (2) (men) Myers
Fall—day. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field.

48 *Introduction to Recreation* (2) (men) Hanken
Spring—day. The role of recreation in modern living; current practices in community recreation work; standards of training, experience, and salary; types of leadership.

49 *Human Anatomy* (3) Stallings
Fall—day. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1–2.†

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

50 *Kinesiology* (3) Lawrence
Spring—day. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

51–52 *Teaching Physical Education Activities* (2–2) (women) The Staff
1963–64 and alternate years: academic year—day. Team sports: basketball, hockey, softball, soccer, speedball. Individual and dual sports: tennis, badminton, archery, swimming and diving, lifesaving and water safety. Gymnastics: tumbling apparatus and trampoline. Locker and towel fee,* $4.50 a semester.

58 *First Aid and Care of Athletic Injuries* (2) DeAngelis
Spring—day. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1–2.†

SECOND GROUP

101 *Physical Education in the Elementary School* (3) Burtner, Snodgrass
Fall—day; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

103 *History and Principles of Physical Education* (3) Myers, Stallings
Fall—day. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

105–6 *Adapted Physical Education and Physical Examinations* (3–3) Lawrence
Academic year—day. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.

107 *Teaching Recreational Dance* (1 to 2) Ingram
Fall—day. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary-school age and adult groups. Square-dance calling is included. Locker and towel fee,* $4.50.

109–10 *Leadership Organization in the Intramural Program* (2–2) (men) DeAngelis
Academic year—day. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.

111–12 *Teaching Physical Education Activities* (2–2) (women) The Staff
1962–63 and alternate years: academic year—day. Continuation of methods and materials in activities listed under Physical Education 51–52. Locker and towel fee,* $4.50 a semester.

113–14 *Practice in Teaching Physical Education Activities* (2 to 4–2 to 4) The Staff
Academic year—as arranged. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* $4.50 a semester.

115–16 *Teaching Team Sports in Secondary Schools* (2 to 4–2 to 4) (men) DeAngelis, Hanken
Academic year—day. Football, basketball, baseball, track and field. Locker and towel fee,* $4.50 a semester.

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

117 *Teaching Modern Dance* (1 to 2) Burtner
1962–63 and alternate years: fall—day. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee.* $4.50.

118 *Dance Production* (1 to 2) Burtner
1962–63 and alternate years: spring—day. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee.* $4.50.

121 *School and Community Health Programs* (3) Krupa
Fall—evening. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1–2.†

122 *Methods and Materials for Health Education* (3) Stallings
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1–2.†

131 *Tests and Measurements in Physical Education* (3) Krupa
Fall—day. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

132 *Camp Leadership* (1 to 2) Stallings
Spring—day. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.

136 *Survey of Dance History and Dance Forms* (3) Burtner
1963–64 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.

138 *Organization and Administration of Physical Education* (3) Krupa, George, Stallings
Spring—as arranged. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.

151–52 *Recreational Leadership Activities* (1 to 3–1 to 3) Abernethy
1963–64 and alternate years: academic year—evening. *First half:* basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. *Second half:* basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.

161 *Community Organization for Recreation* (3) Thompson
1962–63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.

162 *Administration of Community Recreation Programs* (3) Thompson
1962–63 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

* The locker and towel fee is required for registration in one or more of the activity courses.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

REQUIRED AND ELECTIVE COURSES FROM OTHER DEPARTMENTS

PSYCHOLOGY

22 *Introduction to Educational Psychology* (3) ———

Fall—evening; spring—day. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3) Johnson

Fall—day; spring—evening; summer 1962. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

121 *Educational Psychology* (3) ———

Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.

129 *Introduction to Counseling* (3) ———

Fall—evening; summer 1962. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.

131 *Psychological Tests* (3) Hunt

Fall—day; spring—evening; summer 1962. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7.

141 *Leadership, Group Behavior, and Student Life* (3) Kirkbride

Fall—day. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.

144 *Personnel Psychology* (3) ———

Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.

225 *Seminar: Mental Hygiene* (3) Lindley

Fall—evening; spring—day. A study of mental health problems with special attention to needs of counselors.

226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3) Johnson

Spring—evening. A survey of behavior and personality disorders.

231 *Test Construction* (3) Mosél

Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

233 *Individual Psychological Testing* (3) Johnson

Fall and spring—day. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, $7.

STATISTICS

53 *Introduction to Statistics in Psychology and Education* (3) The Staff

Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability

and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

Bright

104 *Statistics in Psychology and Education I* (3)

Fall: lecture (2 hours), laboratory (2 hours)—Saturday morning; summer 1962. Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, $9.

Bright

105 *Statistics in Psychology and Education II* (3)

Spring: lecture (2 hours), laboratory (2 hours)—Saturday morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53 or 104. Laboratory fee, $9.

INDEX

A

Absence, regulations concerning, 35
Academic status, 6
Administration, Officers of, 2
Admission, 30–32
Adult education, Master's field in, 25
Advanced Professional Certificate, 27–28
Advanced standing, 25–26, 27, 31–32
Amount of work, 35
Art, teaching field in, 14
Assistantships, graduate teaching, 41
Attendance, 36
Attitudes needed for success in teaching, 24
Auditor, 38
Awards, 41–42

B

Biology, teaching field in, 14–15
Business education, teaching field in, 15–16

C

Calendar for 1962–63, iv–vi
Changes in program of studies, 38
Chemistry, teaching field in, 16
Classroom teaching, Master's field in, 25
Commencement
  See Graduation
Committees of the faculty, 5
Comparative Education, Master's field in, 25
Comprehensive examination, 27
Contents, Table of, iii
Convocation
  See Graduation
Counseling, courses on, 49, 50, 55
Course numbers, explanation of, 44
Courses of Instruction, 44–56
Credit:
  Explanation of amount of, 45
  For summer school work, 38
  From other institutions, 31
  Transfer of, within the University, 37
Curriculum, Master's field in, 25

D

Dance, courses on, 53, 54
Degrees:
  Bachelor of Arts in Education, 11–24
  Bachelor of Science:
    In Physical Education for Men, 7–10
    In Physical Education for Women, 10–11
  Certificate, Advanced Professional, 27–28
  Doctor of Education, 26–27
  Master of Arts in Education, 25–26
Dishonesty, regulations concerning, 36
Dissertations, requirements for, 29, 39
Distinction, degrees with, 39–40
Dormitories, 42–43
Dropping courses, 37

E

Education:
  Courses in, 45–52
  History of, Master's field in, 25
  Of teachers, 6–7
  Philosophy of, Master's field in, 25
  Secondary, Master's field in, 25
  Teaching fields, 13–20
Elementary Education:
  Bachelor's teaching field in, 16
  Master's field in, 25
  Special curricula:
    In French, 23
    In physical education, 23
    In remedial speech, 23
    In Spanish, 23
Emeritus Faculty, 3
Employed students, amount of academic work, 35
Employee training, Master's field in, 25
English, teaching field in, 16–17
Entrance requirements, 31–32

F

Faculty, alphabetical list, 3–4
Fees and financial regulations, 32–35
Fellowships, 41
Field Service coordinators, 4
Field Studies, directors of, 4
Financial aid, 42
Five-year program, 24–25
French, teaching field in, 17

G

General education backgrounds, 11
General science, teaching field in, 17
Geography, teaching field in, 17
German, teaching field in, 17–18
Grades, 36
Graduation:
  Application for, 38
  Dates,
    See Calendar
  Requirements, 38–40
Guidance:
  Courses on, 49, 50, 55
  Master's field in, 25

H

Health Administration, 43–44
History, teaching field in, 18
Honors, 39–40
Honor Societies, 44
Hospitalization, 43–44

I

"In residence status", 33, 39

L

Leave of absence, 28
Library, 40
Loan funds, 42
Lost and Found Office, 40

M

Mathematics, teaching field in, 18
Medical privileges, 43–44

P

Physical education:
  Courses in, 52–54
  Curricula:
    For men, 7–10
    For women, 10–11
  Teaching field in, 19
Physical examinations, 43
Physics, teaching field in, 19
Prizes, 41–42
Probation, 36
Professional education, 21
Professional organizations, 44
Property, responsibility for, 40
Psychology, courses in, 55

Q

Quality-point index, 36

R

Reading:
  Clinic, 30
  Master's field in, 25
Readmission, 32
Recreation, physical education curriculum in, 9–10
Refunds, 34–35
Registration, 32
  Continuous, 33, 39
Regulations, 35–40
Residence:
  Halls, 42–43
  Requirements, 26, 29–30, 38–39
Rules of the University, right to change, 40
Russian, teaching field in, 19

S

Scholarship, 35–37, 38
Scholarships, 41–42
School Administration, Master's fields in, 25
Science, general, teaching field in, 17
Secondary education, Master's field in, 25
Semester hours:
  Explanation of, 45
  Maximum allowed full- and part-time students, 35
Social studies, teaching field in, 20
Spanish, teaching field in, 20
Special curricula, 23, 30
Speech, teaching field in, 20
Staff of Instruction, alphabetical list, 3–4
Statistics, courses in, 55–56
Student life, 42–44
Summer school credit, 38
Suspension, 37

T

Teaching field preparation, 13–20
Thesis, requirements for, 29, 39
Transcripts of record, 38
Transfer within the University, 37
Trustees, Board of, 1
Tuition, 32

W

Withdrawal, 34–35, 37

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Washington 6, D. C.

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School of Medicine: Doctor of Medicine (M.D.)

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Law School: Bachelor of Laws (LL.B.)

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School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (A.P.C.), and Doctor of Education (Ed.D.)

School of Government, Business and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: Associate in Arts (A.A.), Associate in Science (A.S.), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.)

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The George Washington University

Bulletin



THE DIVISION OF UNIVERSITY STUDENTS

1962-63

WASHINGTON 6, D. C.
APRIL 1962
Vol. LXI No. 10

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In Arts and Sciences

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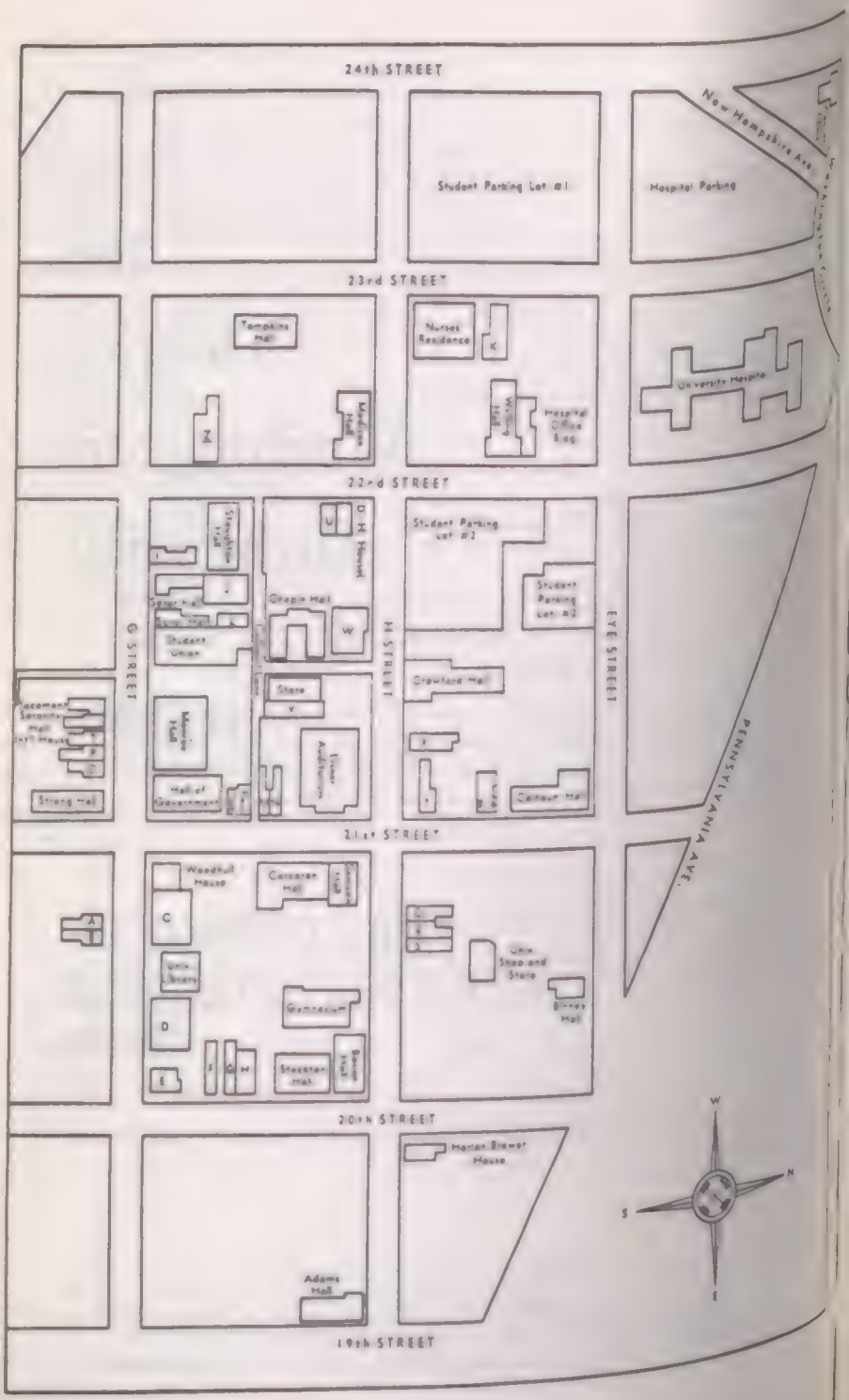
George Washington University

Bulletin

THE DIVISION OF UNIVERSITY STUDENTS 1962-63

VOLUME LXI

APRIL 1962 NUMBER 10


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New Hampshire Ave.
23rd STREET
Tompkins Hall
Madison Hall
Nurses Residence
K
Hospital Office Bldg
University Hospital
22nd STREET
Student Parking Lot #2
Student Parking Lot #3
Strong Hall
D H Hewett
Student Union
Gropius Hall
G STREET
H STREET
EYE STREET
Crawford Hall
Store
Monroe Hall
Hall of Government
Clarke Hall
Basement Sorority Hall (1st Floor)
Strong Hall
PENNSYLVANIA AVE.
21st STREET
Woodhull House
Corcoran Hall
Gymnasium
Stockton Hall
Bacon Hall
Univ. Shop and Store
Bowen Hall
20th STREET
Morton Brewer House
Adams Hall
19th STREET
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E

CONTENTS

	Page
The Calendar	v
The Board of Trustees	1
Officers of Administration	2
The University	3
History and Organization, Academic Status	3
Educational Facilities	4
Library Facilities	6
The Division of University Students	7
Admission	7
Registration	8
Fees and Financial Regulations	9
Regulations	11
Health Administration	14
Veterans Education	15
The Reading Clinic	15
The Speech Clinic	15
The Testing and Counseling Center	15
Student Life	16
Courses of Instruction	18
Accounting	19
Anatomy	22
Art	22
Biochemistry	27
Biology	27
Botany	28
Business and Public Administration	30
Hospital Administration	35
Chemistry	38
Classical Languages and Literatures	41
Economics	42
Education	45
Engineering	52
English	66
Geography	71
Geology	73
Germanic Languages and Literatures	75
History	77
Home Economics	81

Journalism 83
Mathematics 84
Microbiology 88
Pathology 89
Pharmacology 90
Pharmacy 91
Philosophy 93
Physical Education for Men 95
Physical Education for Women 98
Physics 100
Physiology 103
Political Science 104
Psychology 107
Religion 114
Romance Languages and Literatures 116
Secretarial Studies 123
Slavic Languages and Literatures 124
Sociology and Anthropology 125
Speech 130
Statistics 132
Zoology 133

THE CALENDAR

1962

July

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THE CALENDAR 1962–63

Fall Semester:		
Placement tests	Sept. 18	Tues.
Qualifying examinations	Sept. 18	Tues.
Registration*	Sept. 20–22	Thurs.–Sat.
Classes begin	Sept. 24	Mon.
Veterans Day. Holiday	Nov. 12	Mon.
Thanksgiving recess	Nov. 22–24	Thurs.–Sat.
Christmas recess	Dec. 22–Jan. 2	Sat.–Wed.
Classes resume	Jan. 3	Thurs.
Last day of fall-semester classes	Jan. 16	Wed.
Examination period	Jan. 21–26	Mon.–Sat.
Spring Semester:		
Placement tests	Jan. 30	Wed.
Qualifying examinations	Jan. 30	Wed.
Registration*	Jan. 31–Feb. 2	Thurs.–Sat.
Spring-semester classes begin	Feb. 4	Mon.
Winter Convocation. Holiday	Feb. 22	Fri.
Easter recess	April 12–17	Fri.–Wed.
Last day of spring-semester classes	May 15	Wed.
Examination period	May 20–25	Mon.–Sat.
Summer Sessions:†		
Registration for eight-week term	June 17	Mon.
Classes begin	June 18	Tues.
Independence Day. Holiday	July 4	Thurs.
Eight-week term ends	Aug. 9	Fri.
Registration for Fall Semester 1963–64	Sept. 19–21	Thurs.–Sat.

* Thursday and Friday, from 12:00 to 8:00 P.M.; Saturday, from 10:00 A.M. to 1:00 P.M.

† For all schools and colleges offering courses in the Summer Sessions except the Law School and the School of Education.

The calendar for the special sessions of the School of Education is as follows: Twelve-week Evening Session—June 10 to August 30, registration June 10; Nine-week Session—June 18 to August 16, registration June 17; Six-week Session—July 9 to August 15, registration July 8.

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Claud Max Farrington, A.M., *Assistant to the President*
Joseph Young Ruth, A.B., *Director of Admissions*
Frederick Russell Houser, A.M. in Govt., *Registrar; Secretary of the Faculties*
John Russell Mason, A.M., M.S. in L.S., *Librarian; Curator of Art*
William David Johnson, B.S. in B.A., *Comptroller*
Charles William Cole, Ph.D., *Dean of the Summer Sessions*
Benjamin Douglass Van Evera, Ph.D., Sc.D., *Dean for Sponsored Research*
Virginia Randolph Kirkbride, A.M., Ed.D., *Director of Activities for Women*
Don Carlos Faith, Ph.D., *Director of Activities for Men; Director of Veterans Education*
Joseph Richard Sizoo, A.M., D.D., Litt.D., LL.D., L.H.D., S.T.D., *Director of University Chapel*
Alan Thomas Deibert, A.M., *Adviser to Students from Foreign Countries*
Richard Bernard Castell, A.B., M.D., *Director of Health Administration*
Loretta May Stallings, A.M., *Director of Women's Athletics*
Robert Faris, B.S., *Director of Men's Athletics*
Edward Martin Wall, A.B., LL.B., *Director of Air Science*
John Francis Latimer, Ph.D., *Associate Dean of Faculties; University Marshal*

THE DIVISION OF UNIVERSITY STUDENTS

Elmer Louis Kayser, Ph.D., LL.D., *Dean of the Division of University Students*
John Gage Allee, Jr., Ph.D., *Associate Dean of the Division of University Students*

* For the year 1961-62.

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of Columbian College of Arts and Sciences, which offers work leading to Associate's, Bachelor's, and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine; Law; Engineering; Pharmacy; Education; and Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The George Washington University is a privately endowed University located on a well planned campus in the center of Washington within a few blocks of the White House. The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an ex officio member of the Board.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

EDUCATIONAL FACILITIES

Buildings, grounds, and equipment are valued at approximately $27,000,000.

The buildings of Columbian College of Arts and Sciences; the Graduate Council; the National Law Center; the Law School and the Graduate School of Public Law; the School of Engineering; the School of Pharmacy; the School of Education; the School of Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; the University Hospital and Outpatient Department; and the Cancer Clinic are located between Nineteenth and Twenty-fourth Streets and between Pennsylvania Avenue and G Street NW. The School of Medicine is at Fourteenth and H Streets NW. The buildings of the University are as follows:

John Quincy Adams Hall, 730 Nineteenth Street. Residence hall for men.

Bacon Hall, 2000 H Street. Named in honor of the late Joel Smith Bacon, President of the University from 1843 to 1854. Offices of the Dean of the Graduate Council, the Dean of the Graduate School of Public Law, the Dean for Sponsored Research, the Assistant to the President, the Development Division, the Forensic Medicine Institute, the Management Research Group, the Educational Counselor. Offices and lounge for the Law Faculty; the Alumni Office; Alumni Reception Room.

Binney Hall, 2018 Eye Street. Named in honor of the late Joseph Getchell Binney, President of the University from 1855 to 1858. Offices, classrooms, and laboratories of the Reading Clinic.

John C. Calhoun Hall, 2100 Eye Street. Residence hall for men.

Chapin Hall, 2128 H Street (rear). Named in honor of the late Stephen Chapin, President of the University from 1828 to 1841. Offices and classrooms of the Air Force ROTC.

Corcoran Hall, 725 Twenty-first Street. Named in honor of the late William W. Corcoran, benefactor of the University and a former member of the Board of Trustees. Offices of the Treasurer, the Cashier, the departments of Chemistry and Physics; Chemistry Research Project; the chemistry and physics laboratories; classrooms.

William H. Crawford Hall, 2119 H Street. Residence hall for women.

Davis-Hodgkins House, 731 Twenty-second Street. Offices and lounges of engineering students' organizations.

Everglades Apartments, 2223 H Street. Residence hall for nurses.

Faculty Club House, 714 Twenty-first Street.

Gymnasium, 2010–12 H Street.

Hall of Government, 710 Twenty-first Street. The gift of the late Mrs. Henry Alvah Strong, former Trustee of the University. Offices of the Dean of the School of Government, Business, and International Affairs; the departments of Accounting, Business and Public Administration, Economics, History, Political Science, and Statistics. Offices of the Air Force Advanced Management Program, Air Force Military and Economics Program, and Navy Graduate Financial Management Program; classrooms.

Harlan-Brewer House, 1923 H Street. Offices of law student organizations; lounges, reading rooms.

Health Care and Hospital Administration Building, 816 Twenty-first Street. Offices and seminar rooms of Health Care and Hospital Administration Program.

Hospital and Outpatient Department, Washington Circle.

Hospital Staff Office Building, 818 Twenty-second Street.

International House, 2110 G Street. Office of the Adviser to Students from Foreign Countries; club rooms.

Lisner Auditorium, 730 Twenty-first Street. The gift of the late Abram Lisner, former Trustee of the University. The Auditorium; Lisner Lounge; offices and classrooms of the Department of Speech, the Speech Clinic, and the housing officer; Athletic Ticket Office.

Dolly Madison Hall, 736 Twenty-second Street. Residence hall for women.

James Monroe Hall, 2115 G Street. Offices of the deans of Columbian College of Arts and Sciences, the Division of University Students, the School of Education; the departments of Education, English (English and American Literature), Germanic Languages, Journalism, Mathematics, Psychology, and Secretarial Studies; classrooms.

Office of the President, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Associate Dean of Faculties, Administrative Secretary, and department of Classical Languages.

Placement Office, 2114 G Street.

Samson Hall, 2036 H Street. Named in honor of the late George Whitefield Samson, President of the University from 1859 to 1871. Comptroller's Office; Disbursing Office; offices of the departments of Chemistry, Geology, and Physics.

School of Medicine, 1335–1339 H Street. Offices of the Dean and Staff of the School of Medicine; the Medical Library; laboratories; lecture rooms; research laboratories; student and faculty lounges; and University Medical Bookstore.

Sorority Halls:

2112 G Street. Apartments of Kappa Alpha Theta and Kappa Delta sororities.

2129 G Street. Apartments of Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Zeta Tau Alpha, and Kappa Kappa Gamma sororities.

2131 G Street. Apartment of Delta Gamma Sorority.

2137 F Street. Apartment of Alpha Epsilon Phi Sorority.

802 Twenty-first Street. Apartment of Phi Sigma Sigma Sorority.

Staughton Hall, 707 Twenty second Street. Named in honor of the late William Staughton, President of the University from 1821 to 1827. Offices and laboratories of the Navy Logistics Research Project.

Stockton Hall, 720 Twentieth Street. Named in honor of the late Rear Admiral Charles Herbert Stockton, President of the University from 1910 to 1918. Law School; offices of the National Law Center and the Dean and Faculty of the Law School; library; and lecture halls.

Hattie M. Strong Hall, 620 Twenty-first Street. Named in honor of the donor, the late Mrs. Henry Alvah Strong, former Trustee of the University. Residence hall for women.

Student Union, 2125 G Street. Offices of student organizations, student cafeteria and snack bar, reading room, lounge, game and music room, and the "Lost and Found" Office.

Tompkins Hall of Engineering, 725 Twenty-third Street. The gift of the late Charles H. Tompkins, former Trustee of the University. Offices of the Dean of the School of Engineering; the departments of Civil, Electrical, and Mechanical Engineering; the programs in Engineering Administration, Engineering Science, and Metrology; the Center for Measurement Science; Electronics Research Project, Computer Research Project, National Aeronautics Space Administration; Engineering testing laboratories, general laboratories, drafting rooms, and classrooms.

University Book Store, 2120 H Street. University Medical Bookstore, 1335 H Street.

University Library, 2023 G Street. The gift of the late Abram Lisner, former Trustee of the University. The library, rooms of the Board of Trustees, Faculty Conference Room, classrooms, office of the Dean of the National Law Center.

The Helen L. and Mary E. Warwick Memorial Building, 2300 K Street. Diagnostic and treatment rooms, and research laboratories of The George Washington University Cancer Clinic.

Welling Hall, 814 Twenty second Street. Named in honor of the late James Clarke Welling, President of the University from 1871 to 1894. Residence hall for men.

Woodhull House, 2033 G Street. Gift of the late General Maxwell Van Zandt Woodhull, former Trustee of the University. Office of the Director of Activities for Women; meeting rooms for student activities.

Building A, 2026 G Street. Offices of the Department of Romance Languages.

Building B, 2024 G Street. Offices, laboratories, and classrooms of the Department of Home Economics.

Building C, 2029 G Street. Offices of the Registrar and the Director of Admissions; offices and laboratories of the departments of Botany, Geology, and Zoology; language laboratories; classrooms.

Building D, 2013 G Street. Offices of the Business Manager, Maintenance; Mail Room; Human Resources Research Project.

Building E, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Associate Dean of Faculties, and Administrative Secretary; office of the Department of Classical Languages.

Building F, 706 Twentieth Street. Offices of the Dean of the College of General Studies.
Building G, 712 Twentieth Street. Offices of the Department of English (Composition section); Academic Editor.
Building H, 714–16 Twentieth Street. Offices and locker rooms of the Department of Physical Education for Women.
Building I, 2135 G Street. Offices, classrooms, and laboratories of the Department of Geography.
Buildings J and L, 2131 and 2129 G Street (rear). Classrooms and locker rooms of the Department of Physical Education for Women.
Building K, 817 Twenty-third Street. Classroom, playing court, locker rooms, and office of the Department of Physical Education for Women.
Buildings M and N, 716–18 Twenty-first Street. Offices of the departments of Slavic Languages and Philosophy; offices and laboratories of the Testing and Counseling Center.
Building O, 2106 G Street. Offices of the Department of Religion and University Chapel.
Building P, 2108 G Street. Offices of the Student Health Service and the Dean of the Division of Special Students.
Building Q, 2029 H Street. Offices of the Director of Activities for Men, the Director of Veterans Education, and the Superintendent of Maintenance.
Building R, 2027 H Street. Offices of the Director of Athletics, and the Athletic Staff.
Building S, 2025 H Street. Offices of the Department of Physical Education for Men and Public Relations.
Building T, 2110 G Street. Offices of the Dean of the Summer Sessions; Chairman of Committee on Scholarships; International House (see International House).
Building U, 729 Twenty-second Street. Driver Behavior Research Project.
Building V, 2114 H Street. Research laboratories of the Department of Physics.
Building W, 2128 H Street. Offices of the Dean and Faculty of the School of Pharmacy; pharmacy laboratories; classrooms.
Building X, 2107 H Street. Offices of the departments of Art and Sociology and Anthropology; Music Program; Population Research Project; Faculty offices.
Building Y, 802 Twenty-first Street. Offices of the Department of Business and Public Administration, Center for Behavioral Sciences.
Building Z, 708 Twenty-second Street. Offices of the Patent, Trade-Mark, and Copyright Foundation.

LIBRARY FACILITIES

The Library collections of the University are housed in the University Library and in the departmental libraries of law and medicine.

These collections contain approximately 361,100 volumes—278,600 in the University Library, 58,000 in the Law Library, and 24,500 in the Medical Library. Approximately 10,000 volumes a year are added to the Library's resources. Endowments, supplementing the University appropriation, provide books in the fields of American civilization, American Literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive 2,100 periodicals.

Information concerning the use of the Libraries may be obtained at the Library service desks. A classified list on cards of selected recent acquisitions is available at frequent intervals, in addition to the complete information in the card catalogue. Monthly art exhibits are held on the first and second floors of the University Library during the academic year.

The hours of the University Library and the Law Library are Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.; Sunday, 2:00 to 6:00 P.M. The Medical Library is open Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.

THE DIVISION OF UNIVERSITY STUDENTS*

E. L. Kayser, *Dean;* J. G. Allee, Jr., *Associate Dean*

THE DEAN'S COUNCIL†

I. B. Hansen, F. E. Johnston, R. D. Kennedy

GENERAL INFORMATION

INTRODUCTORY

The Division of University Students was established in 1930 to make the regular course offerings of the University more generally available to members of this metropolitan community and others, not at the time candidates for degrees in this University. In this Division are registered mature students who wish to undertake university courses for credit or as auditors. University students may be employed in government or industry, taking courses to increase their vocational fitness or to inform them on new developments in the arts and sciences. They may be taking courses as a matter of personal interest for cultural enrichment. Such students may be candidates for higher degrees in other institutions, sent here for special work as part of a graduate program. They may be undergraduates, matriculated in other colleges, taking summer sessions courses only or courses for transfer during the regular academic year with the approval of their own institution. To serve members of such groups and others, not enrolled in degree-granting branches of the University, is the function of the Division of University Students.

ADMISSION

The University accepts both men and women. Students are admitted at the beginning of each semester and summer session.

The right is reserved to refuse admission to any student with an academic record which creates doubt of his ability to succeed in college or who, for any other reason, would not be an acceptable student.

Application for Admission and Readmission

Forms for application for admission or readmission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FE 8-0250, extension 344.

Application for admission‡ to *nondegree status* in the Division of University Students, must be received, with a $5 application fee and necessary credentials, no later than the Saturday preceding the first day of registration, as stated in the University calendar.

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* This listing of Administrative Officers is for the year 1961–62.

† The Dean of Faculties, the Dean and the Associate Dean of the Division are members ex officio of the Council.

‡ An application for readmission does not require a fee unless it involves transfer to a college, school, or division of the University other than the one in which the applicant was last registered. In this case, a $3 transfer fee is required.

Readmission

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded) must apply for readmission in the Office of the Director of Admissions.

ENTRANCE REQUIREMENTS*

Good character and an academic background appropriate for the program of studies contemplated are required.

Students 21 years of age or over who are not interested in working for a degree in this University may be considered for admission to the Division of University Students to take courses for which they have adequate preparation, as evidenced by previous scholastic records.

Students under 21 years of age who meet the entrance requirements of Columbian College of Arts and Sciences but who are not seeking degree candidacy at this University may be admitted to the Division of University Students to pursue programs of study approved by the Dean.

If a student currently or previously registered in the Division of University Students applies for admission to degree candidacy, a maximum of 45 semester hours of credit will be considered for assignment, in so far as these credits are appropriate toward the degree sought.

In special instances, with the permission of the instructor, a person may be considered for admission as an auditor in a class without being required to take active part in the exercises or to pass examinations, but no credit will be allowed for such attendance.

REGISTRATION

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions (see "Admission", page 7).

A student previously registered in the University who was not on-campus during the immediately preceding semester (summer sessions excluded), must apply for readmission in the Office of Admissions.

No registration for credit is accepted for less than a semester or one summer session.

A student may not register concurrently in this University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration.* Allowance for credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

Time and Place of Registration

Registration for the Division of University Students is conducted in Building C, 2029 G Street NW., during the following periods: *fall semester,* September 20 and 21, 12:00 to 8:00 P.M.; September 22, 10:00 A.M. to 1:00 P. M. *Spring semester,* January 31 and February 1, 12:00 to 8:00 P.M., February 2, 10:00 A.M. to 1:00 P.M.

* Entrance requirements are established by the faculties of the several colleges, schools, and divisions. The Director of Admissions, as agent for the faculties, administers regulations governing admission, readmission, and transfer.

FEES AND FINANCIAL REGULATIONS

Fees paid by students cover only a portion of the cost of their instruction and of the operation of the University. Income from endowment funds, grants, and gifts from alumni and friends of the institution make up the difference.

The fees listed, effective during the academic year 1961–62, are subject to change upon action of the Board of Trustees.

Tuition Fees

For each semester hour for which the student registers except for courses in Engineering	$30.00
For each semester hour for which the student registers for courses in Engineering	35.00

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

Special Fees

Application fee, charged each applicant for admission to nondegree status, nonrefundable	5.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Admission tests (when required)	6.00–12.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program: dropping or adding a course, changing from one section to another within a course, change of status (from auditor to credit status or vice versa), and change in credit hours for a course	2.00
Withdrawal fee, charged in special cases	5.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees")	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
For each examination to qualify for advanced standing and for each special examination	5.00
English test for foreign students (when required)	5.00
Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor	3.00
Transcript fee, charged for each transcript of record after the first	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under Health Administration. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

*Payable at the time of application for transfer or readmission.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or attend classes until all fees are paid. Fees are due and payable in advance at the time of each registration.

With the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration. Installment-due notices are mailed. However, nonreceipt of notice is no excuse for failure to meet obligations when due.

A student who fails to meet payments when due, but pays his fees within the following two weeks of the date on which payment is due, is charged a $2 service fee. A student who fails to meet payments within these two weeks after payment is due is automatically suspended and may not attend classes until he has been officially reinstated and paid all accrued fees and a $5 reinstatement fee.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice (see "Withdrawal", pages 12 and 13).

In authorized withdrawals and changes in schedule, financial adjustments will be made as follows:

Fall Semester

Withdrawal dated on or before the last working day* in October or November cancellation of two-thirds or one-third, respectively, of tuition charges.

Spring Semester

Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

In no case will a refund be made of the first third of the total tuition charges. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this be credited to another semester.

Students in chemistry or pharmacy who fail to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged

* The University work week is Monday through Friday, inclusive.

a $3 checkout fee. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

REGULATIONS

A student enrolled in the University is required to conform to the following University regulations and to comply with the rules and regulations of the college, school, or division in which he is registered.

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Dean) for subsequent registration in any unit of the University.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. Regular attendance is required. A student may be dropped from any course for undue absence.

A student suspended for any cause may not attend classes during the period of suspension.

SCHOLARSHIP REQUIREMENTS

A student who fails to maintain the scholarship requirements of this Division may be dismissed from the University.

Grades

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors.

Undergraduate.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the dean's council of the college, school, or division concerned. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. A student may not repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

Graduate.—For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete).

The Quality-Point Index

Undergraduate.—Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete record in this University.

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not superseded by a proper grade within the allotted time, it is computed as zero quality points. Grades in courses taken at another institution are not considered in computing the quality-point index.

Probation

A student must maintain a quality-point index of at least 2.00, or be placed on probation. He remains on probation as long as his index is below 2.00.

Suspension

A student whose index falls below 1.50 is subject to suspension.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. A student suspended twice for poor scholarship will not be readmitted.

Examinations

Examinations are scheduled at the end of each semester or at the completion of the course.

Academic Dishonesty

Evidence of dishonesty on the part of any student will result in his suspension from the University upon the recommendation of the Dean's Council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for all courses in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in computation of the quality-point index.

If a student suspended because of academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the quality-point index.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Permission to withdraw from the University will not be granted a student who does not have a clear financial record. (See "Fees and Financial Regulations", pages 9–11.)

Withdrawal between the last working day* in October and the end of the fall

* The University work week is Monday through Friday, inclusive.

semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

CHANGES IN PROGRAM OF STUDIES

Changes within a College, School, or Division.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the Dean.

Change from one section to another of the same course may be made with the approval of the Dean and the department concerned.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned.

Students wishing to transfer from the Division of University Students to a degree granting college or school of the University should note that a maximum of 45 semester hours will be accepted in transfer and that in all undergraduate divisions, except the lower division of Columbian College of Arts and Sciences and the College of General Studies, 30 semester hours, including *at least 12 semester hours* in the major field, must be completed *in residence* in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill.

CREDIT

Credit is given only after registration for a course and satisfactory completion of the required work.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged

* The University work week is Monday through Friday, inclusive.

for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intend-

* A charge for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

† See Rule (3) for exception.

ing to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

VETERANS EDUCATION

The George Washington University is approved to provide training for those who are eligible under the provisions of Public Laws 634, 190, 550, 16 and 894. The Office of Veterans Education, Building Q, 2029 H Street NW., operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office concerning the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D. C.

THE READING CLINIC

The Reading Clinic, 2018 Eye Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition special reading improvement classes are conducted on the high school and adult level.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups with common reading difficulties, $3.25 a lesson. All fees are payable in advance at the Office of the Cashier.

THE SPEECH CLINIC

The Speech Clinic, Lisner Auditorium, 730 Twenty-first Street NW., offers diagnostic and corrective work for children and adults with such speech difficulties as stuttering, lisping, cleft palate, cerebral palsy, asphasia, foreign accent, voice, and articulatory problems.

Fees.—There is no charge for the diagnosis. The fee for individual instruction is $7 an hour; for group instruction, $4 an hour. Fees are payable at the Office of the Cashier.

THE TESTING AND COUNSELING CENTER

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

The Center provides special testing services including: diagnostic tests prescribed by the School of Engineering, admissions tests for the University and for other educational institutions, and tests for business and industry.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is $7.50; for students currently enrolled in the University but not as degree candidates, the fee is $30; for graduates of the University, $30; for community clients, $45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains seven residence halls. For detailed information, request the special bulletin, which is available at the offices of the Director of Activities for Men and the Director of Activities for Women.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the religious organizations of their choice. These various denominational groups form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

University Chapel

The University Chapel is a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling on personal problems.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally.

and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers outstanding employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting officers. The services of the Counseling Center (see pages 15–16) are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

INTERNATIONAL HOUSE

International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the University in the summer of 1962 and in the academic year 1962–63. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

HOURS OF INSTRUCTION

Classes are scheduled in the morning, afternoon, and evening. Evening and daytime sections of the same course are identical, are taught by the same staff of instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the usual four years, a part-time student may complete the requirements and obtain a degree.

EXPLANATION OF COURSE NUMBERS

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the instructor, and when the completion of additional work has been certified by the instructor.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the instructor to qualified seniors; they are not open to other undergraduates.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3–3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING*

Professors R. D. Kennedy *(Chairman)*, Edwin Lewis, J. O. Eaton
Professorial Lecturers F. C. Brimacombe, J. L. Buckler, F. V. Demaret, Frank Higginbotham, C. A. McLaughlin, C. L. Simpson, L. W. Hamilton, I. E. Steele
Associate Professor F. C. Kurtz
Associate Professorial Lecturer O. C. Disler
Lecturer E. E. Pontius, Jr.
Instructor M. G. Gallagher

First Group

1-2 *Introductory Accounting* (3–3) — Kennedy and Staff

First half: fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. *First half:* basic principles underlying accounting records, preparation of the work sheet and financial statements, accounting for single proprietorships and partnerships. *Second half:* accounting for corporations and introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 *General Accounting* (3) — Kennedy and Staff

Not offered 1962–63. Study of accounting systems and accounting for single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

Second Group

101 *Cost Accounting* (3) — Eaton

Fall—day and evening; summer 1962. Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; and analysis and interpretation of cost data. Prerequisite: Accounting 1–2.

102 *Advanced Cost Accounting* (3) — Eaton

Spring—evening. Advanced cost accounting theory and problems with emphasis on development and analysis of standard costs, the use of cost data for managerial control, and distribution cost accounting. Prerequisite: Accounting 101 or permission of the instructor.

111 *Financial Statement Analysis* (3) — Kennedy, Steele

Fall—day; spring—evening; summer 1962. Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1–2 or permission of the instructor.

115 *Survey of Accounting* (3) — Disler, Gallagher

Fall—evening; spring—evening; summer 1962. Accounting for single proprietorships and corporations with emphasis on the use of accounting information in the management process; study of theory, terminology, and the analysis and interpretation of accounting data. Not open for credit to Accounting or Business Administration majors.

121–22 *Intermediate Accounting* (3–3) — Gallagher, Simpson

Academic year—day and evening. *First half:* valuation and amortization problems of current assets, long-term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

* The Staff of Instruction here listed is for the academic year 1961–62.

132 *Accounting Theory* (3) Kennedy
Spring—day. Development of basic accounting principles and concepts with special reference to current thought expressed by the American Institute of Certified Public Accountants and the American Accounting Association. Prerequisite: 6 hours of accounting.

141 *Governmental Accounting* (3) Lewis
Fall—evening. Problems relating to governmental appropriation accounts, encumbrances, and fund accounting. Emphasis on municipal and state government accounting with an introduction to federal accounting. Prerequisite: Accounting 1-2 or permission of the instructor.

144 *Federal Accounting* (3) Lewis
Spring—evening. Accounting procedures in the Federal Government, with emphasis on agency level accounts, implementation of accrued expenditure legislation, and accounting support for cost-based budgets. Accounts of the United States Treasury; current concepts of allotment, obligation, and disbursement accounting and reporting. Prerequisite: Accounting 141 or permission of the instructor.

147 *Federal Budgeting* (3) Lewis
Not offered 1962–63. Budgetary procedures in the Federal Government, with emphasis on agency level budget programming, budget formulation and the techniques for achieving management objectives through the budget process; cost-based budgeting; expenditure programming and accrued expenditure limitations; revenue estimating. Prerequisite: Accounting 144 or extensive experience in federal budgeting.

161 *Income Tax Accounting* (3) Kurtz
Fall—evening. Problems involved in the federal income taxation of individuals and corporations, differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1–2.

162 *Federal Tax Practice* (3) Kurtz
Spring—evening. Advanced problems of federal tax practice such as the tax treatment of partnerships, estates, trusts, corporate reorganizations, foreign income, and gifts; use of the tax services; assessment, collection, and refund procedures. Prerequisite: Accounting 161 or the permission of the instructor.

171 *Auditing* (3) Eaton
Fall—evening; spring—day. Duties and responsibilities of auditors: principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121–22.

172 *Auditing Practice* (3) Eaton
Spring—evening. Preparation of audit reports, accounting statements to be filed with Securities and Exchange Commission, and current developments of auditing standards and practice. Prerequisite: Accounting 171 or permission of the instructor.

181 *Accounting Systems* (3) Lewis
Fall—evening. Theory and procedure of designing and installing accounting systems for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121–22, and 171, or permission of the instructor.

191 *Advanced Accounting* (3) Kurtz, Simpson
Fall—evening; summer 1962. Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121–22.

193 *Business Budgeting* (3) Lewis, Buckler
Fall—day; spring—evening; summer 1962. Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1–2.

196 *Accounting Policy and Control* (3) Lewis
Not offered 1962–63. Accounting decision-making and analytical techniques, em-

phasizing the financial policy and operational role of the accountant and his contribution to enterprise management. Readings, cases, and problems form a basis for class discussions. Prerequisites: Accounting 101, 111, 161, and 171, or permission of the instructor.

198 *Professional Accounting Review* (3) Lewis

Spring—evening. Review and coordination of the principles and techniques developed in the accounting curriculum, in preparation for general practice in the field of accountancy and for professional accounting examinations. Prerequisite: Accounting 101, 141, 162, 171, and 191, or permission of the instructor.

THIRD GROUP

211–12 *Managerial Accounting* (3–3) Kennedy, Higginbotham

First half: not offered 1962–63. *Second half:* fall—evening. *First half:* analysis of the accounting system with special reference to the use of financial and operating records and accounting reports as tools of management; a study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1–2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite to Accounting 212: Accounting 211 or permission of the instructor.

215 *Survey of Managerial Accounting* (3) Higginbotham

Spring—evening. Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process. Prerequisite: Accounting 1–2, 3, or 115.

231 *Contemporary Accounting Theory* (3) Kurtz, Higginbotham

Spring—evening; summer 1962. Advanced accounting principles and concepts and recent theories concerned with the valuation and amortization of assets and determination of income. Admission by permission of the instructor.

246 *Governmental Accounting and Budgeting Problems* (3)

Not offered 1962–63. Advanced principles and practices in federal accounting relationship to general policy and administration. Prerequisite: Accounting 144 or permission of the instructor.

275 *Internal Control and Auditing* (3) Kurtz

Summer 1962. Internal accounting controls; review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitableness. Emphasis on the use of internal control and auditing as an aid to management. Prerequisite: Accounting 171 or permission of the instructor.

295–96 *Seminar in Accounting* (3–3) Kennedy

Academic year—evening. Selected accounting research topics and problems; individual oral and written reports. Admission by permission of the instructor.

297–98 *Accounting Reading and Research* (3–3) Kennedy and Staff

Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) Kennedy and Staff

Academic year—as arranged; summer 1962.

ANATOMY*

Professors I. R. Telford *(Chairman)*, Paul Calabrisi
Professorial Lecturer T. D. Stewart
Associate Professors F. D. Allan, T. N. Johnson
Assistant Professors J. B. Christensen, J. C. Bartone
Clinical Instructors R. N. Brown, L. E. Church, L. C. Dearden

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Special Lecturer B. S. Blumberg

201–2 *Gross Anatomy* (8–2) — Calabrisi and Staff
Academic year—as arranged. For qualified nonmedical graduate students. Same as Anatomy 101–2. Anatomy 201—laboratory fee, $21; Anatomy 202—laboratory fee, $16.

203 *Human Embryology* (2) — Allan and Staff
Spring—as arranged. For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, $8.

204 *Neuroanatomy* (3) — Johnson and Staff
Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, $13.

205 *Microscopic Anatomy* (4) — Telford and Staff
Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, $13.

221–22 *Seminar* (1–1) — Telford and Staff
Academic year: 1 hour a week—as arranged. Research reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.

249–50 *Introduction to Medical Research*† (3–3) — The Staff
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

295–96 *Research* (arr.) — The Staff
Academic year—as arranged. Fee to be arranged.

299–300 *Thesis* (3–3)

ART*

Professors D. C. Kline *(Chairman)*, W. A. MacDonald
Associate Professor L. P. Leite
Associate Professorial Lecturer Grace Evans
Assistant Professor George Steiner
Studio Lecturers on the Staff of the Corcoran School of Art Edmund Archer, Richard Lahey, Jessalee Sickman, Heinz Warneke, C. E. Forsythe, Kenneth Hine, Harry Gates, Jack Perlmutter, Alexander Russo

* The Staff of Instruction here listed is for the academic year 1961–62.
† This is an interdepartmental course. The student should register in the department directing his research.

ART HISTORY AND THEORY

First Group

1 *Art Appreciation* (3) — MacDonald
Fall—day; spring—day; summer 1962. A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and the ideas in art through the ages. (Primarily for nonmajors.)

31–32 *Survey of Western Art* (3–3) — Leite
Academic year—day. A survey of the arts in the Western World from prehistoric to modern times. A foundation for further study in the history of art.

71–72 *Introduction to the Arts in America* (3–3) — Kline
Academic year—evening; summer 1962—Art 71 (3). Painting, sculpture, and architecture of America, with selected references to the crafts and popular arts. *First half:* from Colonial beginnings to the Republican Age. *Second half:* from early 19th century to the present.

101 *Greek and Roman Architecture* (3) — MacDonald
Fall—day.

102 *Greek and Roman Sculpture* (3) — MacDonald
Spring—day.

103 *Medieval Art* (3) (Formerly Art 102) — Evans
Fall—day. A study of architecture, sculpture, and painting from the formative states of Christian Art in the Byzantine Age through the Romanesque and Gothic periods.

104 *Renaissance Art in Italy I* (3) — Leite
Fall—day. The early developments from the 13th to the 15th century.

105 *Renaissance Art in Italy II* (3) — Leite
Spring—day. The High Renaissance and Mannerism.

106 *Renaissance Art in the North* (3) — Leite
Summer 1962. A study of the painting in the Netherlands, Germany, France, Spain, and Portugal.

107 *Eighteenth Century Art in Europe* (3) — Evans
Spring—day. The development of painting, sculpture, and architecture in 18th century Europe.

109 *Nineteenth Century Art in Europe* (3) — Leite
Fall—day. Painting and sculpture from Academism to Symbolism.

110 *Contemporary Art* (3) — Leite
Spring—day; summer 1962. Painting and sculpture in 20th century Europe.

111 *Classical Archeology* (3) — MacDonald
Not offered 1962–63. A study of archeological monuments of classical civilizations, with intensive study of one or more areas selected from architecture, sculpture, painting, or minor arts.

112 *Art of Egypt and the Ancient Orient* (3) — MacDonald
Spring—day. A study of the art of Mesopotamia, Anatolia, Egypt, and Persia.

113 *Baroque Art in Italy* (3) — Leite
Fall—day. The development of painting, sculpture, and architecture in the 16th and 17th centuries in Italy.

114 *Baroque Art in the North* (3)
Not offered 1962–63. The development of painting, sculpture, and architecture in the 16th and 17 centuries in Holland, Flanders, Spain, France, Germany, and England.

115 *Christian Iconography* (3) (Formerly Art 210) Leite
Not offered 1962–63. The origins and development of Christian symbols and themes from Early Christian to modern times.

116 *Classical Iconography* (3) (Formerly Art 211) MacDonald
Not offered 1962–63. The origin and development of myths in classical art.

120 *Art of China and Japan* (3) (Formerly Art 204) Kline
Fall—day. The architecture, painting, and sculpture of China, Korea, and Japan.

141 *Interior Decoration* (3) Kline
Fall—day. A study of the principles of decoration dealing with furniture designs and ensemble layout, draperies, color, accessories, and lighting.

142 *House Planning* (3) Kline
Spring—day. Study of the contemporary house for family living, including site problems, the case plan, materials of building, and climate conditioning.

143 *Folk Arts in America* (3) Kline
Not offered 1962–63. Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts; selected references to American folk music.

THIRD GROUP

203 *Primitive Art** (3) Kline
Summer 1962. The arts of prehistoric and primitive man in Europe in the pre-Columbian Americas, Oceania, and Africa.

207 *Modern Architecture* (3) Kline
Spring—day. The development of modern architecture and building technology in Europe and America from the late 19th century to the present.

243 *Seminar in American Art* (3) Kline
Not offered 1962–63.

244 *Seminar in Naturalism and Realism* (3) Leite
Not offered 1962–63. A reading knowledge of French is desirable.

245 *Seminar in Romanticism* (3) Leite
Not offered 1962–63. A reading knowledge of French and German is desirable.

246 *Seminar in Classical Art* (3) MacDonald
Fall—day.

247 *Seminar in Symbolism* (3) Leite
1962–63 and every third year: spring—day.

248 *Studies in Classical Art* (3) MacDonald
Summer 1962.

261–62 *Theory and Criticism* (3–3) (Formerly Art 161–62) MacDonald
Academic year—evening. The history of theory and criticism in Classical, Medieval, Renaissance, and Modern times.

271–72 *Museum Techniques*† (arr.) MacDonald
Academic year—as arranged. Assignments in intern training in museum work. Students may take this course three days a week from 9:00 A.M. to 5:00 P.M. throughout the academic year and earn 3 credits a semester; or they may take it intensively, 5 days a week from 9:00 A.M. to 5:00 P.M., and earn 6 credits in one semester.

289–90 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

* May be taken for undergraduate credit with the approval of the instructor.
† Primarily for candidates for the degree of Master of Arts in the field of Museology and students in the Special Program in Museum Training.

DRAWING AND PAINTING, SCULPTURE, AND COMMERCIAL ART

First Group

21–22 *Basic Composition and Techniques** (3–3) Forsythe
Academic year—day and evening; summer 1962—Art 21 (3). Study of the fundamentals of two- and three-dimensional composition; an investigation of materials and their application.

41–42 *Drawing and Perspective* (3–3) Russo
Academic year—day and evening; summer 1962—Art 41 (3). An introductory course in object and figure drawing and mechanical perspective.

65–66 *Drawing and Painting I—Life, Still Life, and Portrait* (3–3) The Staff
Academic year—day; summer 1962—Art 65 (3).

81–82 *Sculpture I* (3–3) Warneke
Academic year—day and evening.

Second Group

125–26 *Drawing and Painting II—Life, Still Life, and Portrait* (6–6) Sickman
Academic year—day.

127–28 *Drawing and Painting II—Life and Portrait* (6–6) Archer
Academic year—day and evening.

135 *Commercial Design* (3) Hine
Summer 1962. Studies of the principles and applications of graphic design.

157–58 *Print Making* (6–6) Perlmutter
Academic year—day. Relief printing and wood block, with special reference to western and eastern techniques.

159–60 *Anatomy and Techniques* (6–6) Russo
Academic year—day. Special problems in anatomy and drawing and painting of the life model in action.

165–66 *Drawing and Painting II—Life and Portrait* (6–6) Lahey
Academic year—day and evening; summer 1962—Art 165 (3)†.

175–76 *Advanced Composition* (6–6) Forsythe
Academic year—day and evening; summer 1962—Art 175 (3)†. Advanced problems in creative design and composition; development of representational skills.

179–80 *Sculpture II* (6–6) Warneke
Academic year—day and evening. Portrait-life modeling and composition in clay, plaster and wood carving.

183–84 *Commercial Art* (6–6) Hine
Academic year—day and evening. Instruction in fundamental principles: to analyze, visualize, and skillfully express ideas.

185–86 *Advanced Commercial Art* (6–6) Hine
Academic year—day and evening. Practice in the development of professional techniques for thumb-nail and comprehensive layouts; preparation of professional portfolio.

189–90 *Advanced Sculpture* (6–6) Warneke
Academic year—day and evening. Advanced problems in modeling and direct carving. (Restricted to students who have completed 18 hours of sculpture).

* Art 21–22 is prerequisite to all other studio courses.
† May be taken for 6 semester hours with the approval of the instructor.

THIRD GROUP

265–66 *Painting III* (6–6) — The Staff
Academic year—day and evening; summer 1962—Art 265 (3)*.

275 *Painting IV* (6) — The Staff
Fall—as arranged; spring—as arranged; summer 1962—Art 275 (3)*.

279–80 *Sculpture III* (6–6) — Warneke
Academic year—as arranged.

281 *Sculpture IV* (6) — Warneke
Fall—as arranged; spring—as arranged.

299–300 *Thesis* (3–3) — The Staff
Academic year—as arranged; summer 1962.

MUSIC

FIRST GROUP

3–4 *Music Appreciation* (3–3) — Steiner
Academic year—day and evening; summer 1962—Music 3 (3). An introduction to the historical sequences of musical style, the elements of music principle and musical forms, the works of the chief composers, and the study of instruments and other media of musical presentation.

5–6 *Fundamentals of Music* (3–3) — Steiner
Academic year—evening. Elements of music—basic concepts of pitch, rhythm, scales, intervals and chords, notation and terms.

51–52 *Orchestra* (1–1) — Steiner
Academic year—evening. Preparation and performance of orchestral literature. Prerequisite: audition before Director.

SECOND GROUP

103–4 *History of Music* (3–3)
Academic year—day; summer 1962—Art 103 (3). The development of music in the Western World from the Early Christian era to the 20th century.

131–32 *Harmony* (3–3)
Academic year—evening. Chord structure, inversions, modulations, figured and unfigured bass. Practice in elementary harmonic writing.

RELATED COURSE IN ANOTHER DEPARTMENT

Classical Languages and Literatures 71–72 *Greek and Roman Backgrounds in Literature* (3–3)

* May be taken for 6 semester hours with the approval of the instructor.

BIOCHEMISTRY*

Professors J. H. Roe *(Emeritus)*, C. R. Treadwell *(Chairman)*
Professorial Lecturers W. R. Carroll, Irving Gray, Arthur Weissbach
Associate Professor B. W. Smith
Associate Professorial Lecturer Leon Swell
Assistant Professors G. V. Vahouny, J. M. Bailey
Associate H. W. Clark, Jr.

Special Lecturer Sidney Udenfriend

221–22 *General Biochemistry* (4–4) — Vahouny
Academic year—Tues. and Thurs., 8:00 to 12:00 A.M. A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 152. Material fee, $15 a semester.

224 *Biochemistry of the Enzymes* (1) — Weissbach
Spring—Mon., 5:00 P.M. Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.

225–26 *Biochemical Procedures* (3–3) — Smith and Staff
Academic year—as arranged. A laboratory course. Material fee, $16 a semester.

227–28 *Biochemistry Seminar* (1–1) — The Staff
First half: Fri., 5:00 P.M. *Second half:* Fri., 4:00 P.M. The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.

232 *Proteins and Amino Acids* (1) — Carroll
Spring—Wed., 5:00 P.M. A lecture course. Prerequisite: Biochemistry 113 or 221.

241 *Isotopes* (2) — Gray
Fall—Sat., 8:00 A.M. Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromotography.

249–50 *Introduction to Medical Research** (3–3) — Bailey
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

251 *Carbohydrate Metabolism* (1) — Roe
1962–63 and alternate years: fall—Sat., 9:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

261 *Biochemistry of the Lipids* (1) — Swell, Treadwell
Fall—Sat., 12:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

295–96 *Research in Biochemistry* (arr.) — The Staff
Academic year—as arranged.

299–300 *Thesis* (3–3) — The Staff

BIOLOGY

SEE THE DEPARTMENTS OF BOTANY AND ZOOLOGY.

* The Staff of Instruction here listed is for the academic year 1961–62

BOTANY*

Professor R. B. Stevens *(Chairman)*
Professorial Lecturer L. B. Smith
Associate Research Professor J. M. Kaper
Associate Professorial Lecturers Kittie Parker, Caroline Adams, R. S. Sigafoos, Edward Hacskaylo, H. M. Cathey
Lecturers G. A. Livingston, W. A. Shropshire, Jr.

BIOLOGY†

First Group

The Staff

1–2 *Introductory Biology*† **(4–4)**

An interdepartmental course. Lecture (2 hours), laboratory (4 hours).
Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.
Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.
This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

BOTANY

Second Group†

Parker

105 *Field Botany* **(3)**

Lecture (1 hour), laboratory and field (4 hours). 1963 and alternate summers. A course, primarily for nonspecialists, emphasizing local flora.

Hacskaylo, Shropshire

106 *Plant Growth* **(3)**

Lecture (2 hours), laboratory (2 hours). Summer 1962 (as Botany 116). 1963 and alternate summers. A course, primarily for nonspecialists, emphasizing practical problems of growing and caring for plants. Material fee, $8.

Bowman

107–8 *Organic Evolution*† **(3–3)**

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. A study of the theories of organic evolution and present ideas on the principal lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechanisms involved in this process from the fields of genetics and cytology.

Adams

109–10 *Plant Morphology* **(3–3)**

1963–64 and alternate years. *First half:* seed plants—lecture (2 hours), laboratory (2 hours); material fee, $8. *Second half:* lower groups—lecture (1 hour), laboratory and field (4 hours).

Bowman

115–16 *Cytology*‡ **(3–3)**

Lecture and laboratory. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—Botany 115 (3) (as Biology 115). Plant and animal cells and their components, including the chromosomes

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* The Staff of Instruction here listed is for the academic year 1961–62.
† Biology 1–2 is prerequisite to all second-group courses, except by permission of the instructor. Beginning with the academic year 1962–63, Biology 1–2 *Introductory Biology* (4–4) replaces Botany 1–2 *General Botany* (3–3) and Zoology 1–2 *Introduction to Zoology* (4–4). Botany 1–2 and Zoology 1–2 will be offered for the last time in the summer of 1962.
‡ An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

and their role in heredity, with training in the preparation of materials for study. Material fee, $8 a semester.

125–26 *Plant Taxonomy* (3–3) Parker
Lecture (1 hour), laboratory and field (4 hours). 1963–64 and alternate years.

127 *Genetics** (3)
Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man.

131–32 *Mycology* (3–3) Stevens, Hacskaylo
Lecture (2 hours), laboratory (2 hours). 1962–63 and alternate years: academic year—evening. Material fee, $8 a semester.

133–34 *Plant Pathology* (3–3) Stevens
Lecture (2 hours), laboratory (2 hours). 1963–64 and alternate years. Material fee, $8 a semester.

135–36 *Plant Physiology* (3–3) Cathey
Lecture (2 hours), laboratory (2 hours). 1962–63 and alternate years: academic year—evening. Prerequisite: Chemistry 11–12 or permission of the instructor. Material fee, $8 a semester.

140 *Cell Physiology** (3) Shropshire
Spring—evening. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12.

141–42 *Plant Ecology* (3–3) Sigafoos
Lecture (1 hour), laboratory and field (4 hours). 1962–63 and alternate years: academic year—evening.

Third Group

201–2 *Seminar: Cytology** (3–3) Bowman
Academic year—evening.

221–22 *Seminar: Taxonomy* (3–3) Smith
1962–63 and every fourth year: academic year—as arranged.

231–32 *Seminar: Mycology and Plant Pathology* (3–3) Stevens
1964–65 and every fourth year.

235–36 *Seminar: Plant Physiology* (3–3) Cathey, Hacskaylo
1963–64 and every fourth year.

241–42 *Seminar: Plant Ecology* (3–3) Sigafoos
1965–66 and every fourth year.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962—Botany 295 (arr.) Fee to be arranged.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

BUSINESS AND PUBLIC ADMINISTRATION*

Professor A. R. Johnson, J. L. Jessup, J. C. Dockeray ***(Chairman)***, D. S. Brownt, A. M. Woodruff, G. C. Jacobus, R. B. Eastin, F. H. Gibbs, R. F. Ericson, G. L. Lippitt, T. H. Carroll

Professorial Lecturers M. E. Ogdon, K. E. Stromsem, J. L. Krieger, C. W. Clewlow, W. G. Torpey, J. N. Stonesifer, A. C. Lazure, K. F. McClure, F. L. Shaffner, C. E. Houston, C. G. Berns, Edward McCrensky, S. N. Alexander, Robert Kaye, L. C. Collins, J. P. Murphy

Associate Professors John Clayton, Leonard Prestwich, Waldo Sommers, D. R. Cloutier, L. I. Gintzig, T. R. Bennett II

Associate Professorial Lecturers John Provan, J. R. Snitzler, F. K. McTyier, V. B. Lewis, George Idelson, J. A. Morrow, Ross Pollock

Assistant Professors A. D. Larson, R. E. Griffiths, H. R. Page

Lecturers R. J. Bond, J. F. Doubleday, W. L. Jobanek, D. K. Good

BUSINESS AND PUBLIC ADMINISTRATION

Third Group

201 *Advanced Administrative Management* (3) Eastin, Ericson, Gibbs
(Replaces Business Administration 201 and Public Administration 210)
Fall—day and evening; spring—evening. An advanced course in administration emphasizing principles and practices common to administrative units of all kinds.

204 *Quantitative Factors in Administration* (3)
Spring—evening. Developments in quantitative methods of administration. Morrow

205 *Seminar in Communication and Executive Action* (3)
(Formerly Public Administration 242)
Spring—evening. Seminar in the communications processes. Research and analysis, identification of factors relating to receptivity; the dynamics of communication. Torpey

206 *Personnel Management* (3)
(Formerly Public Administration 231)
Fall—evening. Basic principles; structure and organization of personnel offices; responsibilities; interagency relationships; personnel staffing, training, and work measurement.

207–8 *Human Relations in Administration* (3-3) Bennett, Brown
(Replaces Business Administration 275–76, and Public Administration 241)
Academic year—evening. Individual, group, intergroup, and other human behavior and development; application of social science research to administration. Practical applications will be emphasized. Ericson

262 *Contemporary Administrative Theory and Practice* (3)
(Formerly Public Administration 262)
Spring—evening. Current theories and trends in management with particular attention to the behavioral sciences communications and applicability of research. Clewlow

268 *Management Engineering* (3)
(Formerly Business Administration 268)
Fall—day and evening; spring—evening. Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys including the study of work measurements, work simplification management audits, and other management improvement programs.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence fall semester 1961–62

287 *Relation of Government to Business* (3) Clayton
(Formerly Business Administration 287)
Spring—evening. Activities of government in their relation to business management in such areas as labor relations, wages, production, and prices.

BUSINESS ADMINISTRATION

Second Group

101 *Introduction to Business* (3) _____
(Formerly Business Organization and Combination)
Fall—day and evening; spring—day; summer 1962. The business environment; its effects upon the decision making process.

102 *Fundamentals of Management* (3) Ericson, Page
Fall—day and evening; spring—day and evening; summer 1962. Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.

105 *Personnel Management* (3) Eastin, Stonesifer
Fall—day; spring—evening; summer 1962. Industrial personnel and manpower programs, organizations and policy in personnel activities.

106 *Problems in Personnel Management* (3) Eastin, Stonesifer
Spring—day. Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.

107 *Labor-Management Contracts* (3) Sommers
Fall—day; spring—evening. Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.

109 *Office Management* (3) _____
Fall—evening; spring—evening. Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.

113 *Real Estate* (3) Doubleday
Fall—evening. Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.

121 *Risk Management* (3) Doubleday
Spring—evening. A general course in underlying principles of property, life, marine, and casualty insurance, and the function of insurance in the economic life of a business or individual.

122 *Life Insurance and Estate Planning* (3) Doubleday
Spring—evening. Life insurance contracts, their use in providing protection and estate development.

131 *Business Finance* (3) Clayton
Fall—day; spring—day and evening. Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1–2.

136 *Credit Management* (3) _____
Spring—evening. Types and sources of credit information, credit relationships from the standpoint of the commercial bank and the commercial business enterprise. Prerequisite: Accounting 1–2.

138 *Investments* (3) Dockeray, Shaffner
Spring—evening; summer 1962. Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1–2.

141 *Principles of Marketing* (3) Prestwich
Fall—evening; spring—day; summer 1962. An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1–2.

142 *Marketing Management Problems* (3) Prestwich
Spring—day. Practical problems of retailers, wholesalers, and manufacturers considered through the use of cases and text material; fundamental considerations in marketing decisions and the nature of the problem-solving process. Prerequisite: Business Administration 141.

143 *Marketing Research* (3) Prestwich
Fall—day. Principles and practices of marketing research with particular emphasis upon basic methods and techniques, sources and interpretation of data, and presentation of results.

145 *Sales Management* (3) Eastin
Spring—evening. Organization of the sales department, sales planning and forecasting, quotas, territories, performance standards, and analysis and control of distribution costs. Prerequisite: Business Administration 141.

147 *Advertising* (3) Idelson
Fall—evening. Advertising as a function of marketing and merchandising; uses and limitations of advertising as a tool of management; fundamentals involved in getting a finished advertisement before potential customers; evaluation, criticism, and control of advertising.

150 *Procurement and Materials Management* (3) Prestwich
Spring—evening. Purchasing organization, procedures, and policies; market relationships; selection of merchandise and sources of supply; procurement information and records; evaluation of procurement practices in industry and government.

153 *Principles of Personal Selling* (3) Prestwich
Summer 1962. Basic principles that underlie personal selling and the practical application of these principles. Emphasis is given to the human factor. Career opportunities and the role of selling in our economy are also considered.

158 *Traffic Management* (3) Kaye
Spring—evening. Organization and records of traffic department, routing of shipments, services by carriers, rates and charges, relation of shipper to transportation agencies.

161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3) Berns, Collins, McClure
Fall—day and evening.

162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3) Berns, Collins, Murphy
Spring—day and evening.

163 *Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts* (3) Murphy
Fall—evening.

171 *Principles of Transportation* (3) Clayton
Fall—evening. Impact of transport on society; development, economic characteristics, services, rates, and regulation of the various modes of domestic intercity transportation.

172 *Public Utilities* (3) Clayton
Not offered 1962–63. Legal and economic meaning of the public utility concept; development, services, economic characteristics, ratemaking, and regulation of the various utility industries, with particular emphasis on electric, gas, telephone, and urban transit industries.

173 *Commercial Motor Transportation* (3) Clayton
Fall—evening. Organization, management, services, economic characteristics, rates, and regulation of motor transport firms; highways and highway financing considered from the point of view of both producers and users of the services.

174 *Commercial Air Transportation* (3) Clayton
Spring—evening. Organization, management, services, economic characteristics, rates, and regulation of air transport firms; policies and activities of the government in the development, promotion, and control of air transport.

175 *Introduction to Foreign Trade* (3) Kaye
Fall—evening. Terminology, trade usages and practices, conditions essential to successful trading, economic bases of international trade, obstacles to trade, tariffs, impact of governmental controls on private trade. Prerequisite: Economics 1–2.

176 *Exporting and Importing* (3) Kaye
Not offered 1962–63. Policy and operating problems of foreign trade, financing, documentation, packing and transportation of shipments, ocean marine insurance, and U. S. Customs procedure and formalities.

178 *Foreign Markets* (3) Ogdon
Spring—evening. Pattern of world trade by countries and commodities, methods of preparing market surveys, selected regional market analyses. Prerequisite: Economics 1–2.

191 *Business Reports and Analyses* (3) ———
Fall—evening. Sources of management information, array and analysis of data, interpretation and presentation of the findings.

193 *Management Communication* (3) Morrow
Fall—evening; spring—day. A survey course in the problems of communication; written communication; style and format; oral communication: oral briefing and presentation; group leadership; rapid reading; completed staff work; and related subjects.

195 *Controllership* (3) ———
Fall—evening. The duties, responsibilities, and place of the controller in a business organization; relations of controller to other departments and regulatory bodies; and the controller's relation to price setting and inventories, depreciation policies, internal auditing, expense control and budgeting; and financial reports to management, stockholders, and employees. Prerequisite: Accounting 1–2. Open to seniors.

197 *Introduction to Business Policy* (3)
Not offered 1962–63. Significance of business policies in management; formulation of policies; relation of various organizational levels to policy making; some significant policies, including case problems.

198 *Case Problems in Management* (3) Eastin, Page
Fall—day and evening; spring—day and evening. Principals and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.

THIRD GROUP

201 *Advanced Management* (3)
Summer 1962. An advanced course in management emphasizing principles of management in relation to business enterprise.

209 *Seminar in Personnel Management* (3) Eastin
Fall—evening. Discussion of industrial personnel and manpower management, and research in advanced problems.

210 *The Personnel Manager* (3) Jessup
Spring—evening. The job of the personnel manager and his place in the organization; relations of the personnel manager to other executives; the personnel manager's policy roles and his relations with the chief executive. Key problems of the senior personnel executive.

213 *Urban Land Management* (3) Woodruff
Spring—evening. Background course for the developing curriculum in city planning. The course traces the forces that lie behind investment decisions which in turn determine the development of cities.

218 *Introduction to Data Processing* (3) Doubleday
Fall—evening; spring—evening. A survey of modern data processing systems with emphasis on the management problems associated with the installation and use of such systems.

219–20 *Data Processing: Mechanics and Applications* (3–3) Alexander, Glaser
Academic year—evening. Characteristics of major computer systems; relation to their selection and application to administrative processes. Feasibility studies. Relationship of data processing and quantitative methods of management. Case studies. Prerequisite: Business Administration 218.

227 *Linear Programming* (3)
Fall—evening. Introduction to the vocabulary and methodology of management science through the study of linear programming techniques. Case studies. Minimum mathematical tools are included.

228 *Introduction to Operations Research for Management* (3)
Spring—evening. Operations research as an approach to the solution of management problems. Emphasis is on the relevance and limitations of operations research. Practical applications are examined. Minimum mathematical tools are included.

231 *Corporate Financial Problems* (3) Dockeray, Houston
Fall—evening. Financial practice in promotion, consolidation, and mergers; capital structure adjustments; and reorganization.

232 *Seminar in Business Finance* (3) Dockeray, Houston
Spring—evening; summer of 1962. Research in advanced financial problems.

237 *Security Analysis* (3) Dockeray, Shaffner
Fall—evening. An advanced course in the applications of investment principles and analytical techniques to the selection of investments. Prerequisite: Business Administration 138.

238 *Seminar in Investments* (3) Dockeray, Shaffner
Not offered 1962–63. Research in investment problems, techniques of selection and the management of various types of funds. Prerequisite: Business Administration 138.

241–42 *Seminar in Marketing* (3–3) Johnson, Prestwich
Academic year—evening. An advanced course in marketing, emphasizing special and current problems in the field. (Business Administration 241 is not a prerequisite for Business Administration 242.)

250 *Contract Administration* (3) Lazure
Fall—evening. The management of government contracts with private suppliers.

251 *Seminar in Retail Management* (3) Prestwich
Not offered 1962–63. Research in retailing practices, with emphasis on trends, new developments, and current problems.

255–56 *Seminar in Foreign Trade* (3) Ogden
Not offered 1962–63. Research, analysis, and discussion of foreign trade institutions, public and private.

273–74 *Readings in Business* (3–3) The Staff
Academic year—as arranged. Advanced readings in the fields of finance, marketing, and personnel management. Admission by permission of the instructor.

278 *The Dynamics of Business* (3) Clayton
Not offered 1962–63. An analysis of the structure of American business, including a study of trend and cyclical change in economic activity and their bearing upon governmental policy.

286 *Management in the Armed Forces* (3) Jessup
Fall—evening. Special problems of military organization and management; applicability of business management techniques to the armed forces.

288 *Executive Leadership* (3) Krieger
Fall—evening. Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and public administration; review of the literature, significant research findings, and practical illustrations.

291 *Seminar in Business Management* (3) Ericson, Page
Fall—evening; spring—evening. Research on various phases of management as practice in American industry.

293–94 *Business Research* (3–3) The Staff
Summer 1962.

296 *Seminar in Controllership* (3)
Spring—evening. Research on advanced problems of the controller in all types of business organization and the Federal Government.

297 *Case Studies in Business Administration* (3) Jessup
Academic year—evening. Problems of management are analyzed with the view of developing a practical solution; cases are used to show the problems of personnel in marketing, industrial management, finance, etc.

299–300 *Thesis* (3–3) Dockeray and Staff
Academic year—evening; summer 1962.

HOSPITAL ADMINISTRATION

Third Group

202 *Introduction to Medical Care Administration* (3) Griffiths
Lecture and discussion (2 hours), laboratory (2 hours). Fall—day and evening. Survey of organizations and activities involved in the maintenance of community health, national public health, hospital bodies, communicable diseases, preventive medicine, medical terminology, biostatistics, and environmental sanitation.

203–4 *Hospital Organization and Management I-II* (3–3) Gintzig
Lecture and discussion (2 hours), laboratory (2 hours). Academic year—day and evening. The history and current character of institutional medical care. Organizational functions and structure of various kinds of hospitals, including psychiatric homes for aged, nursing homes, group clinics, and others related to health care administration. The laboratory is conducted by guest faculty. Prerequisite to Hospital Administration 204: Hospital Administration 203.

205 *Hospital Management Procedures* (3) Gintzig
Lecture and discussion—(2 hours), laboratory (2 hours). Fall—day and evening. A survey of hospital law; a study of hospital forms, procedures, and systems; hospital programs pertaining to disaster relief, safety, fire prevention; personnel, purchasing, and volunteer services; and the operational peculiarities of hospital departments. Prerequisite: Hospital Administration 203.

206 *Case Studies in Hospital Administration* (3) Gibbs
Spring—day and evening. A discussion of general ideas about administration as applied to practical cases. Emphasis is placed on policy making, planning, and controlling in hospitals. Prerequisite: Business and Public Administration 201 and Hospital Administration 203.

207 *Hospital Management Analysis* (3) Gintzig
Lecture (2 hours), laboratory (2 hours). Spring—day and evening. Methods of collecting, analyzing, reporting, and using information that can be made available to administrators of hospitals and other medical care institutions. One day each week is

spent in a medical care institution. This time is devoted to an investigation on which written and oral reports are based. Prerequisite: Business and Public Administration 268 and Hospital Administration 203, 205.

209 *Hospital Finance and Planning* (3) Griffiths

Lecture (2 hours), laboratory (2 hours). Spring—day and evening. Medical economics to include sources of hospital income; fund raising drives; methods of procuring, using, budgeting, and accounting for hospital funds; pre-payment plans, impact on community of the cost of medical care. Regional and specific aspects of hospital planning, designing, constructing, equipping, and supplying. Prerequisite: Hospital Administration 202, 203.

285–86 *Readings in Medical Care Administration* (3–3) The Staff

Academic year—as arranged. Advanced studies in various aspects of hospital, nursing home, and other medical care administration and management. Admission by permission of the Coordinator.

293–94–95 *Hospital Residency I* (3–3–3) Gibbs

The twelve-month residency, beginning June 1 or July 1 of each year, has four major objectives: work experience under a qualified preceptor; periodic seminars with University staff; periodic written progress reports of work accomplished; and a final written report of a major investigation. (Other courses may be substituted for Hospital Administration 294–95 as appropriate.)

296–97–98 *Hospital Residency II* (3–3–3) Gibbs

For selected students who take a second year of residency. The Staff

299–300 *Thesis* (3–3)

Academic year—as arranged.

PUBLIC ADMINISTRATION

Third Group

211 *Problems of Governmental Organization* (3)

Fall—evening; summer 1962. Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships.

212 *Case Studies in Public Administration* (3)

Spring—evening; summer 1962. Analysis and discussion of problems in public management, approached by the group using primarily the case method. Brown

213 *Administration in Government* (3)

Fall—evening; spring—evening. Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

215 *Seminar in Comparative Administrative Systems* (3)

Fall—evening. Examination and analysis of the administrative systems of the major foreign governments with particular attention to practices applicable to administration in the United States. Sommers

221–22 *Staff Functions in Government* (3–3)

Academic year—evening. Designed primarily to provide an understanding of the nature, use, and problems of the staff functions as tools of management. Survey of such staff areas as personnel, budgeting, controllership, procurement, property management, the agency lawyer, security, public relations and information, planning, research, the secretariat, management engineering, auditing, accounting, and administrative services. Sommers

225–26 *Internship in the Administrative Processes* (3–3)

Academic year—as arranged. This course is open only to persons selected by government agencies for participation in approved intern programs.

232 *Federal Personnel Procedures* (3) Torpey
Spring—evening; summer 1962. Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.

233 *Seminar in Manpower Development and Utilization* (3) Sommers
Fall—evening. Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.

237 *Intermediate Management and Supervision* (3) Eastin
Fall—evening. The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.

251 *Governmental Budgeting* (3)
Fall—evening; spring—evening; summer 1962. The role of budgeting in management; the principles and practices of budgetary formulation and administration.

252 *Seminar in Planning and Programming* (3) Jacobus
Fall—evening. Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.

254 *Controllership in the Federal Services* (3) Krieger
Spring—evening. Function of the controller in federal agencies; special problems analyzed; comparison of the controller function in government and business.

259 *Government Procurement and Property Management* (3)
Not offered 1962–63. Principles and problems of government procurement; accounting and inventory; storage; development of specifications; property management.

260 *Seminar in Policy Formulation and Administration* (3) Jacobus
Fall—evening. Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.

261 *Public Opinion and the Administrator* (3) Stromsem
Fall—evening. Theories, techniques, and methods of working with the public; the use of interest groups in developing governmental programs; evaluating public relations programs; the importance of timing; use of public opinion measurement techniques.

271 *Reading and Conference Course in Public Management and Administration* (3) Brown
Not offered 1962–63. The purpose of this course is to provide advanced students with directed reading in specific areas of public management and administration.

272 *Seminar in Public Personnel Administration* (3) The Staff
Spring—as arranged. The purpose of this course is to provide advanced students with directed reading in specific areas of public personnel administration.

297 *Seminar in Public Administration* (3) The Staff
Summer 1962. Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships.

299–300 *Thesis* (3–3) The Staff
Academic year—evening; summer 1962.

CHEMISTRY*

Professors B. D. Van Evera, S. N. Wrenn, C. R. Naeser *(Chairman)*, R. C. Vincent, W. F. Sager, R. E. Wood, T. P. Perros
Associate Professors J. W. Harkness, W. E. Schmidt, D. G. White
Associate Professorial Lecturer Margaret McPherson
Assistant Professors R. C. Sentz, Margaret Ethier

First Group

3–4 *Fundamentals of Physical Science* (4–4) Schmidt, Ethier
A year course: credit is not given for the first half until the second half is completed. Lecture (3 hours), laboratory (3 hours). Academic year—day. Introduction to methods and achievements of physical science, covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, $11 a semester.

11–12 *General Chemistry* (4–4) The Staff
A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. Elementary course in general chemistry. Prerequisite: one year of high school algebra. Laboratory fee, $18 a semester.

13–14 *General Chemistry* (4–4) White
A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). Academic year—day and evening. A terminal course in general chemistry for students in the School of Engineering except those selecting the curriculum leading to the degree of Bachelor of Science in Engineering with a chemistry option. Those students should register for Chemistry 11–12 in their first year. Prerequisite: Physics 11 and Mathematics 21 or 29. Laboratory fee, $18 a semester.

21 *Qualitative Inorganic Analysis* (4) Vincent
Lecture (2 hours), laboratory (6 hours). Fall—day and evening; spring—day and evening; summer 1962. Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12 or a placement examination which may be waived at the discretion of the instructor. Laboratory fee, $18.

22 *Quantitative Inorganic Analysis I* (4) Schmidt
Lecture (2 hours), laboratory (6 hours). Spring—day and evening; summer 1962. Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, $18.

Second Group

111–12 *Physical Chemistry Lectures* (3–3) Wood
A year course: credit is not given for the first half until the second half is completed. Academic year—day and evening. Introduction to physical chemistry. Students registering for Chemistry 111–12 must register concurrently for Chemistry 113–14 unless they already have adequate credit for physical chemistry laboratory. Prerequisites: either (1) Chemistry 22 and 152, Mathematics 22 or 30, Physics 13 or 15, or (2) Chemistry 21, Mathematics 22 or 30, Physics 14.

113–14 *Physical Chemistry Laboratory* (2–2) Wood
A year course: credit is not given for the first half until the second half is completed. Academic year—day (also Saturday). Laboratory to accompany Chemistry 111–12.

* The Staff of Instruction here listed is for the academic year 1961–62

Students registering for Chemistry 113–14 must register concurrently for Chemistry 111–12 unless they already have credit for lectures in physical chemistry. Laboratory fee, $18 a semester.

122 *Quantitative Inorganic Analysis II* (4) Schmidt
Lecture (2 hours), laboratory (6 hours). Fall—day and evening. Continuation of Chemistry 22 including theory and practice of separations, organic reagents, electrochemistry, and colorimetry in analysis. Prerequisite: Chemistry 22. Laboratory fee, $18.

134 *Descriptive Inorganic Chemistry* (2) White
Spring—day. An intermediate level course emphasizing the descriptive chemistry of the elements. Prerequisite: Chemistry 22, 151.

135–36 *Inorganic Chemistry: Preparations* (2–2) Perros
First half: fall—day, spring—evening. *Second half:* spring—evening. Application of the technique of inorganic chemistry to the preparation and purification of a list of selected substances. Prerequisite: Chemistry 152 and 134. Laboratory fee, $18 a semester.

151–52 *Organic Chemistry* (4–4) Wrenn, Sager
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—lecture (3 hours), laboratory (3 hours), day and evening; summer 1962. *Second half:* spring—lecture (2 hours), laboratory (6 hours), day and evening; summer 1962. Chemistry of the compounds of carbon. Prerequisite*: Chemistry 21. Laboratory fee: Chemistry 151, $12; Chemistry 152, $20.

153 *Special Laboratory in Organic Chemistry* (1) Wrenn, Sager
Spring—day and evening. A course designed to give the chemistry major additional and broader training in the technique of organic chemistry than in Chemistry 151–52. Prerequisite: Chemistry 151. Prerequisite or concurrent registration: Chemistry 22 and 152. Laboratory fee, $12.

155 *Organic Chemistry: Preparations* (2 or 3) Wrenn
Spring—evening. Synthesis of organic compounds and application of the technique of organic chemistry to the preparation of pure compounds, using larger amounts and greater refinements than in Chemistry 151–52. Prerequisite: Chemistry 22 and 152. Laboratory fee, $10.50 a semester hour.

156 *Qualitative Organic Analysis* (3) Sentz
Fall: lecture (1 hour), laboratory (6 hours)—evening. Identification of pure organic compounds, separation of mixtures, and identification of their components. Required of all students planning thesis work in Organic Chemistry. Prerequisite: Chemistry 22 and 152. Laboratory fee, $18.

191 *History of Chemistry* (2) Perros
1963–64 and alternate years. Historical development of chemistry. Prerequisite: Chemistry 22 and 152.

193 *Chemical Literature* (1) Wrenn
Fall—evening. A general course in chemical literature with reference work and reports. Prerequisite: Chemistry 22 and 152. Prerequisite or concurrent registration: Chemistry 111–12 and 113–14.

THIRD GROUP†

203 *Chemical Kinetics* (2) Wood
1963–64 and alternate years. The rates of chemical reactions and the factors influencing them. Prerequisite: Chemistry 112.

211–12 *Physical Chemistry* (2–1) Wood
Academic year—day and evening. Same course as 111–12. Chemistry 211–12 may be taken for credit only by special permission. Credit will be assigned only upon the satisfactory completion of Chemistry 213.

* This prerequisite may be waived in the case of the student who has earned a grade of *C* or better in Chemistry 12 within the past two years or by a placement examination.
† The appropriate qualifying examination is prerequisite to all advanced courses.

213 *Chemical Thermodynamics* (3) Wood
Fall—evening. Application of thermodynamics to chemical problems. Thermochemistry, homogeneous and heterogeneous equilibria, statistical calculation of thermodynamic properties, electrochemistry. Prerequisite: grade of *A* or *B* in Chemistry 111–12, *Satisfactory* in 211–12, or qualifying grade in physical chemistry qualifying examination.

216 *Statistical Mechanics* (3) Sager
1962–63 and alternate years: fall—evening. An introduction to classical and quantum statistics designed to acquaint the student with the basic principles and application of the method. Prerequisite or concurrent registration: Chemistry 213 or permission of instructor.

217 *Chemical Bonding* (2) Sager
1962–63 and alternate years: spring—evening. A survey of modern developments in the theory of valence with emphasis on application to problems of stability and structure of complex molecules. Prerequisite: Chemistry 213 or permission of instructor.

221–22 *Advanced Analytical Chemistry* (2 or 3–2 or 3) Schmidt
Lecture (2 hours), laboratory (3 hours—optional). *First half:* fall—evening. *Second half:* not offered 1962–63. Theory and application of recent methods of analysis including electrical and optical instrumentation. Prerequisite: Chemistry 22 and 122. The lectures may be taken for 2 credits a semester without laboratory work, either half may be taken first. Laboratory fee, $11 a semester.

231–32 *Special Topics in Inorganic Chemistry* (2–2) White, Perros
Academic year—evening. A series of one-semester courses covering such topics as (1) chemistry of the less familiar elements, (2) organometallic, organosilicon, and carbonyl compounds, and (3) co-ordination chemistry. Prerequisite: Chemistry 235.

233–34 *Radiochemistry* (2–2)
1962–63 and alternate years: academic year—evening. The preparation, properties, and uses of radioactive isotopes, both natural and artificial. Prerequisite: Chemistry 235–36. Naeser

235–36 *Inorganic Chemistry* (3–2)
Academic year—evening. Application of modern chemical theories to inorganic substances and reactions, followed by a detailed study, developed from the periodic table, of the chemistry of the more common elements. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111–12 and 113–14. Sager

251–52 *Advanced Organic Chemistry* (3–3)
Academic year—evening. Syntheses, reactions, and properties of carbon compounds, fundamental theories of organic chemistry. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111–12, 113–14. Wrenn

253 *Advanced Synthetic Organic Chemistry* (3)
Spring—evening. Study of reactions employed in the synthesis of organic compounds. Prerequisite: Chemistry 251. Sager

257 *Theoretical Organic Chemistry* (3)
1963–64 and alternate years. Survey of modern theories of organic chemistry with emphasis on reaction mechanisms. Prerequisite: Chemistry 252. The Staff

291–92 *Seminars: Recent Developments in Chemistry* (1–1)
Academic year—day. The Staff

295–96 *Research* (arr.)
Academic year—as arranged; summer 1962. Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, $7.50 a semester hour. The Staff

299–300 *Thesis* (3–3)
Academic year—as arranged; summer 1962. Laboratory fee, $18 a semester

CLASSICAL LANGUAGES AND LITERATURES*

Professor J. F. Latimer *(Chairman)*
Associate R. G. Crawford

LATIN AND GREEK

First Group

1–2 *First-year Latin* (3–3) The Staff

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Functional presentation of the essentials of the language, with appropriate reading selections; development of English derivatives; introduction to Roman life and literature.

3–4 *Second-year Latin* (3–3) Crawford

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. A continuation of the first-year course, but with increased emphasis on Latin readings which illustrate Roman life and literature; continuation of vocabulary building in English. Prerequisite: Latin 1–2 or two years of high school Latin.

11–12 *First-year Greek* (3–3) The Staff

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Essentials of grammar with appropriate reading selections.

13–14 *Second-year Greek* (3–3) The Staff

A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. 1963–64 and alternate years: academic year—evening; 1964–65 and alternate years: academic year—day. Review of grammar; rapid reading from selected Greek authors.

49–50 *Latin Grammar and Readings* (3–3) The Staff

1963–64 and alternate years: academic year—day. Primarily for graduate students preparing for reading examinations. Undergraduates admitted by permission of the instructor. No academic credit for graduate students. *First half:* essentials of Latin grammar with appropriate reading selections. *Second half:* continuation of grammar with selections from various Latin authors for rapid reading.

51–52 *Introduction to Latin Prose and Poetry* (3–3) The Staff

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Selections from Cicero and Caesar, Virgil and Ovid. Prerequisite: Latin 3–4 or three years of high school Latin.

Second Group

101–2 *Roman Comedy* (3–3) The Staff

1963–64 and alternate years: academic year—day. Selected plays from Plautus and Terence. Prerequisite: Latin 51–52 or permission of the Instructor.

111–12 *Roman History and Philosophy* (3–3) The Staff

Not offered 1962–63. Selections from Cicero, Sallust, Lucretius, and Livy. Prerequisite: Latin 51–52 or permission of the Instructor.

121–22 *Roman Lyric Poetry and Satire* (3–3) The Staff

Not offered 1962–63. Selections from Catullus, Horace, Juvenal, and Martial. Prerequisite: Latin 101–2 or permission of the Instructor.

* The Staff of Instruction here listed is for the academic year 1961–62.

COURSES IN ENGLISH TRANSLATION

First Group

71–72 *Greek and Roman Backgrounds in Literature* (3–3) Latimer

First half: 1962–63 and alternate years: spring—day. *Second half:* 1963–64 and alternate years: fall—day. Selected Greek and Roman masterpieces and their literary influence. This course satisfies the literature requirement, see page 52.

Second Group

109–10 *Greek and Roman Drama* (3–3) The Staff

Not offered 1962–63. 1963–64 and alternate years: academic year—evening; 1964–65 and alternate years: academic year—day. Selected tragedies of Aeschylus, Sophocles, Euripides, and Seneca; selected comedies of Aristophanes and Menander, Plautus and Terence; historical development of classical drama.

CLASSICAL HEBREW

First Group

21–22 *First-year Classical Hebrew* (3–3) Seidman

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Fundamental principles of the language with practice in reading simple narrative prose.

23–24 *Second-year Classical Hebrew* (3–3) Seidman

A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. 1963–64 and alternate years: academic year—day; 1964–65 and alternate years: academic year—evening. Review of grammar and exegesis of selected passages from the Hebrew text of the Old Testament.

ECONOMICS*

Professors A. E. Burns†, D. S. Watson, T. W. Holland, J. W. Kendrick, W. E. Schmidt
Professorial Lecturers Gerhard Colm, R. A. Young, Hans Heymann, Jr.
Associate Professors J. W. Skinner *(Chairman)*, Henry Solomon *(Research)*
Associate Professorial Lecturer R. L. Sammons
Instructors L. D. Bothwell, Ching-Yao Hsieh

First Group

1–2 *Principles of Economics*‡ (3–3) Skinner and Staff

Lecture (2 hours), recitation (1 hour). *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—evening; spring—day and evening; summer 1962. Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

Second Group

101–2 *Economic Analysis* (3–3) The Staff

First half: fall—day and evening; spring—evening; summer 1962. *Second half:* spring—day and evening. Analysis of demand, supply, and commodity pricing; theory of

* The Staff of Instruction here listed is for the academic year 1961–62.
† On sabbatical leave spring semester 1961–62.
‡ Economics 1–2 is prerequisite to all other courses in Economics.

national income determination; pricing of productive services; welfare economics. Economics 101 is prerequisite to Economics 102.

104 *History of Economic Thought* (3) Burns
Spring—day. History of the major schools of economic thought; influence of changing problems on the development of economic theory.

105 *Business Cycles* (3) Kendrick
Fall—evening. Description and analysis of the facts of economic instability, survey of recent business cycle theory, forecasting, and consideration of counter-cyclical policies.

121 *Money and Banking* (3) ———
Fall—day and evening; spring—evening; summer 1962. Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.

123 *Monetary Theory and Policy* (3) ———
Fall—day. Principal contemporary theories, background of recent monetary policy.

133 *The Economy of the Soviet Union* (3)
Not offered 1962–63. Development and main features of the economic life of the Soviet Union (See History 145–46 and Geography 196).

141 *Unionism and Collective Bargaining* (3) Holland
Fall—evening. The development and characteristics of American unionism and collective bargaining as economic and social institutions, appraisal of economic and social aspects, public policies and controls.

142 *Labor Economics* (3) Holland
Spring—evening. Characteristics of the American labor force, operations of labor markets, wage theories and practices, impact of collective bargaining, causes and characteristics of unemployment, public policies and programs.

161–62 *Public Finance and Taxation* (3–3) ———
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. General survey of government expenditures; sources and methods of taxation; economic effects of expenditures, taxes, and of government debt policies.

165 *Government Control of Economic Activity* (3) Watson
Fall—day. Changing role of government in promoting and regulating economic activity, types and spheres of control.

181–82 *International Economics* (3–3) Schmidt
Academic year—day and evening; summer 1962—Economics 181 (3). Survey of world economics, theories of international trade, analysis of international economic problems and the international organizations.

185–86 *Economic History and Problems of Latin America* (3–3) ———
Academic year—evening. Evolution of the economies of Latin America with particular emphasis on present structures and problems, considered in the regional, country, and sub region contexts. Economics 185, special attention to Middle America; Economics 186, special attention to South America.

190 *Proseminar in Economics* (3) Skinner
Fall—as arranged; spring—as arranged. Comprehensive survey of economics. Prerequisite: Economics 101–2 and 121.

Third Group

201–2 *History and Literature of Economic Thought* (3–3) Burns
Academic year—evening. Critical analysis and interpretation of the development and the literature of economic thought, origins, and problems, of the major types of theory, and their relation to present problems and policies.

203–4 *Contemporary Economic Theory* (3–3) Watson
Academic year—evening. The contributions of Marshall, Chamberlin, Robinson, Hicks, and others.

205 *Theory of Employment and Income* (3) Kendrick
Fall—evening. Determinants of the level of employment and income. Keynesian and classical systems contrasted, and recent literature on the subject.

206 *Business Cycle Analysis* (3) Kendrick
Spring—evening. Empirical analysis of American business cycles; evaluation of the methodology and findings of the National Bureau of Economic Research. Statistical tests of theories of the business cycle.

208 *The National Income* (3) Kendrick
Spring—evening. The theory of economic aggregates; measurement and policy aspects of national income.

210 *Seminar in Economics* (3) Skinner
Academic year—evening. Methodology of economics, integration of economic theories, methods of research. Open only to students who have completed fifteen hours of graduate work in economics.

212 *Seminar in Price Theory* (3) Watson
Fall—evening. Advanced topics in the theory of relative prices. Prerequisite: Economics 203–4 or the equivalent.

213 *Economic Thought in the Twentieth Century* (3) Burns
Summer 1962. Continuation of Economics 201–2. The principal trends in economic thought during the present century.

215–16 *Mathematical Economics* (3–3) Solomon
Academic year—evening. Introduction to the uses of mathematics in economic theory.

217–18 *Survey of Economics* (3–3)
Academic year—evening. Survey of economic analysis and policy. Not open to graduate students in economics or economic policy. Watson

219 *Managerial Economics* (3)
Summer 1962. Analysis of price, production, and inventory policies of business firms.

221–22 *Monetary Theory* (3–3) Young
Academic year—evening. Contemporary monetary theories.

223–24 *Monetary Policy and Central Banking* (3–3) Solomon
Academic year—evening. The money system in its relation to national income; monetary policies of the Federal Reserve and other central banking systems.

231–32 *Quantitative Economics* (3–3)
Academic year—evening. Selected topics in quantitative economics.

241 *Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Fall—evening. An accelerated introductory course in labor economics primarily for graduate students in Personnel Administration.

244 *Problems in Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Spring—evening. Concentrated study of selected economic, social, and legal aspects of labor relations and labor economics.

246 *Foreign Labor Movements* (3)
Spring—evening. Labor in the economic, social, and political structures of selected foreign countries. Contrasts and comparisons with the United States.

251 *Theories of Economic Development* (3) Schmidt
Fall—evening; summer 1962. Growth and change in economic activity, capital accumulation, innovations in technology and business organization.

253 *Productivity Analysis* (3) Kendrick
Fall—evening. Concepts and measures of productivity; relations to economic growth and to structural changes in the American economy.

261–62 *Public Finance and Fiscal Policy* (3–3) Colm
Academic year—evening. Special problems in contemporary public finance and fiscal policy.

263–64 *Theory of Public Finance* (3–3)
Academic year—evening. Criteria for the allocation of government expenditures, principles of taxation, fiscal policy for stable growth.

265–66 *Theory of Economic Policy* (3–3) Watson
Academic year—evening. The nature, forms, methods, and objectives of economic policy; the relation of economic theory to economic policy.

267 *Economic Organization of the Communist Orbit* (3) Heymann
Fall—evening. Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. (See also History 145–46, 247, and Geography 196.)

281–82 *International Economics* (3–3) Schmidt
Academic year—evening. The modern theories of international economics, the variables determining the balance of payments, techniques to obtain balance-of payments equilibrium.

284 *United States Foreign Economic Policy* (3) Schmidt
Not offered 1962–63. Analysis of foreign aid program; international, commercial, and monetary policy of the United States; United States and international economic organization.

285–86 *Economic Development of Latin America* (3–3) Sammons
Academic year—evening. Current policies and programs, capital formation, public and private; foreign loans and investment; social and technological preconditions of investment.

287–88 *Latin America: Trade and Commodity Policy* (3–3)
Not offered 1962–63. Tariffs and exchange control systems, bilateral and general commercial agreements, terms of trade.

290 *Seminar in International Economics* (3) Schmidt
Spring—evening. Advanced topics in international economics. Prerequisite: Economics 281–82 or the equivalent.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

EDUCATION*

Professors J. H. Fox, B. H. Jarman†, B. S. Root *(Chairman)*, A. C. LaBue, G. L. Angel, W. T. Carroll

Professorial Lecturers Madaline Remmlein, Florence Lumsden, H. O. Johnson, Anthony Marinaccio, Clayton Hutchins, J. B. Holden, B. D. Joy, J. P. Walsh, D. D. Darland, K. E. Brown

* The Staff of Instruction here listed is for the academic year 1961–62
† On leave of absence fall semester 1961–62.

Associate Professors Mary Coleman, W. A. McCauley, Carol St. Cyr, H. G. Detwiler
Associate Professorial Lecturers J. C. Lang, LuVerne Walker, R. R. Reed, Eugenia Nowlin, Beverly Crump, Mary Scott, H. M. Wilson, John Giancaspro, Hazel Wilson, Lucille Mitchell, J. L. Cameron, Samuel Kavruck
Assistant Professors R. E. Baker, R. W. Eller
Lecturers E. M. Logan, C. O. McDaniels, Ward Whipple, Harold Cushman, Marcella Bernstein, Edward Goldstein, Joanne Parker, W. B. Evans, Jr.

Field Studies

Director J. W. Charles, *Assistant Director* D. T. McNelis

Field Service Coordinators

Alexander Anderson, *Assistant Principal, Washington-Lee High School, Arlington, Va.;* Mary Maré, *Assistant Principal, Dean of Girls, Wakefield High School, Arlington, Va.;* C. M. Richmond, *Principal, Stratford Junior High School, Arlington, Va.*

A *Reading Clinic* Coleman and Staff
Diagnosis of reading difficulties; individual or group lessons without academic credit. Fee: for individual diagnosis, $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups with common reading difficulties, $3.25.

Second Group

108 *Human Development, Learning, and Teaching* (3) Baker and Staff
(Formerly Education 109–10)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall—day and evening; spring—day and evening; summer 1962 (as Education 109-10 (3-3)). For the general student as well as the prospective teacher. Principles of effective teaching based on an understanding of human development and the nature of learning. Prerequisite: Psychology 22 or 121.

111 *Methods in Elementary Education* (12) Baker and Staff
Fall—Monday through Friday mornings. For seniors in the elementary school curriculum. Methods, materials, appraisal, and field experiences in elementary schools. Problems and procedures in teaching the language arts (including reading, literature for children, oral and written expression, spelling, and handwriting), arithmetic and science, social studies. Planning units of work, general classroom procedures, and evaluation of pupil progress. Observation and participation two mornings a week. Prerequisite: Education 108 and 123.

112 *Educational Measurement* (3) McCauley, Kavruck
Fall—day; spring—evening; summer 1962. Scope, needs, services to students, selection and construction of teacher made tests, interpretation of tests for evidence purposes. Prerequisite: Education 108 and 123.

113 *Elementary School Art* (3) Nowlin
Fall and spring: lecture and laboratory (3 hours)—evening, field work—as arranged; summer 1962 (Crump). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22, or 121. Material fee, $4.50.

114 *Elementary School Music* (3) Reed
Fall and spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22, or 121.

115 *Teaching of Reading in the Elementary School** (3) Parker
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 108 and 123 or teaching experience.

116 *Elementary School Social Studies** (3) Evans
Fall: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962 (Cushman). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

117 *Elementary School Science** (3) St. Cyr
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

120 *Elementary School Arithmetic** (3) Scott
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962 (Baker). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 108 and 123 or teaching experience.

123 *Society and the School* (3) St. Cyr and Staff
(Formerly Education 121–22)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall—day and evening; spring—day and evening; summer 1962 (as Education 121–22 (3–3)). For the general student as well as the prospective teacher. Historical and sociological development of education at the local, national, and international levels; cooperation of the school with other community agencies; organization and operation of schools; functions of school personnel.

128 *Children's Literature** (3) Walker
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1962 (Wilson). For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.

131 *Principles and Methods of Secondary School Teaching* (3) Detwiler, Myers, Stallings
Lecture (2 hours), field work (2 hours). Fall—day and evening; spring—day. For seniors in the secondary school curriculum. Course, unit, and lesson planning; practical techniques used in connection with motivation, the assignment, group procedures, directing study, individual differences, evaluation, clerical routines, disciplines, the homeroom, activity sponsorship, public relations. Prerequisite: Education 108 and 123.

134 *Student Teaching in Secondary Schools* (6 to 9) Detwiler and Staff
134A: fall—as arranged; spring—as arranged. 134B, 134C, 134D: spring—as arranged. For seniors in the secondary school curriculum. Sections A and B are for full-time academic majors (Detwiler). Section C is for academic majors in the intensive program (Detwiler). Section D is for physical education majors (Myers, Stallings). Education 134 student teaching fee, $50. Admission by permission of the instructor. Prerequisite: Education 108 and 123.

135 *Student Teaching in Elementary Schools* (9) Baker
135A and 135B: spring—as arranged. For seniors in the elementary school curriculum. Student-teaching fee, $50. Admission by permission of the instructor. Prerequisite: Education 108 and 123.

* This course may not be taken by students who have completed or who plan to enroll in Education 111.

Special Methods Courses*

To be elected in the senior year after substantial preparation in the teaching fields concerned by the students in the secondary school curriculum. Course requirements and hours of credit vary with license requirements. Practices of successful teachers are studied and actual teaching content as found in current texts and courses of study is reviewed.

136 *Teaching English* (2 to 4) Lumsden
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 18 semester hours in English.

137 *Teaching Speech* (2 to 4) Kosh
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 18 semester hours in Speech or the permission of the instructor.

138 *Teaching Social Studies* (2 to 4) Jarman
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 24 semester hours of social studies.

140 *Teaching Mathematics* (2 to 4) Brown
Spring—evening. Prerequisite*: Mathematics through calculus.

144 *Teaching Science* (2 to 4) Eller
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: 24 to 40 semester hours of science.

146 *Teaching Foreign Languages* (2 to 4) McSpadden
Spring—day. Prerequisite*: 18 semester hours of one foreign language.

148 *Teaching Home Economics* (2 to 4) Towne
Spring—as arranged. Prerequisite*: 30 semester hours of Home Economics.

150 *Teaching Business Subjects* (2 to 4) Shott
Spring—as arranged. Prerequisite*: 30 semester hours of business education.

Third Group†

200 *Human Development, Learning, and Teaching* (3) Lang
(Formerly Education 201–2)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Fall—evening; spring—evening. For graduate students. Principles of effective teaching based on an understanding of human growth and development and the nature of learning. Prerequisite: Psychology 1 and 22, or 121.

203–4 *Comparative Education* (3–3) Jarman
Academic year—evening. Comparison of foreign educational systems with those of the United States, particularly those of Russia, West Germany, Denmark, Switzerland, France, the British Isles, Canada, and Australia.

205–6 *The Curriculum*‡ (3–3) St. Cyr
Academic year—Saturday morning. For experienced teachers. *First half:* curriculum foundations and issues; comparison of curriculum patterns. *Second half:* principles and procedures in curriculum development; group consideration of student problems.

207 *Curriculum Materials*‡ (3) St. Cyr
Summer 1962. For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

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* Prerequisite to all special methods courses: Education 108, 129, and 131. Additional prerequisites are stated under each course.
† A degree from an accredited institution is prerequisite to all third-group courses.
‡ Prerequisite: adequate professional preparation.

209 *Child Growth and Development* (3)

Fall—evening. An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.

210 *Adolescent Growth and Development* (3)

Spring—evening. A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.

211 *Evaluation in Education** (3) LaBue

Fall—evening. Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

212 *Educational Measurement* (3)

Spring—evening. Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.

213–14 *History of Education* (3–3) Jarman

Academic year—evening. *First half:* the European backgrounds of American education. *Second half:* the evolution of the American school system.

215 *Education of Exceptional Children** (3) Goldstein

Fall—evening. For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

216 *Education of Slow-learning Children** (3)

Not offered 1962–63. Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

217–18 *Philosophy of Education** (3–3) Jarman

Academic year—evening; summer 1962—Education 218 (3). *First half:* designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.

219 *Elementary School Classroom Procedures** (3) Baker

Summer 1962. Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.

220–21 *Reading Problems** (3–3) Coleman

Academic year—evening. For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.

225 *Elementary School Reading* (3) Coleman

Summer 1962. For experienced teachers. Developmental and remedial approaches to reading problems. Demonstration of diagnostic and corrective techniques used by the classroom teacher and the reading specialist.

226 *Reading in Secondary Schools* (3) Coleman

Spring—evening. For experienced teachers. Consideration of special problems in the content areas; diagnostic and corrective techniques and materials for the classroom teacher; reading improvement programs.

227 *Basic Issues in Elementary Education* (3) Baker

Fall—Saturday morning. A consideration of basic issues in the purposes, organiza-

* Prerequisite: adequate professional preparation

tion, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.

228 *Instructional Areas in Elementary Education* (3) Baker
Spring—Saturday morning. Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.

229 *Administration of Elementary Education* (3) Bernstein
Fall—evening; summer 1962 (Carroll). For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.

231 *Secondary School Classroom Procedures** (3) Giancaspro
Fall—evening; summer 1962 (Detwiler). Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.

233 *Audio-visual Education** (3) Logan
Spring: lecture (2 hours), laboratory (1 hour)—evening; summer 1962. Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, $7.

241 *Education of the Gifted** (3)
Spring—evening; summer 1962. For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.

243 *Human Relations in the Classroom** (3) Marinaccio
Summer 1962. Principles and practices involved in interpersonal relationships between learner and teacher and among learners.

245 *School and Community** (3) Angel
Fall—evening; spring—evening; summer 1962. The school as an important member of a team of social agencies that builds the community.

247 *Vocational Education** (3) Walsh
Fall—evening. Development in the United States; current conceptions, agencies involved, problems, and trends.

251 *Guidance in Secondary Schools** (3) McDaniels
Fall—evening; summer 1962 (Detwiler). Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.

252 *Organization and Administration of Guidance Services* (3)
Not offered 1962–63. Designed for guidance directors and supervisors and experienced school counselors who hope to qualify for such positions in the near future. Prerequisite: a minimum of 15 semester hours of approved graduate work in Measurement and Guidance. Root

254 *The Junior High School** (3)
Not offered 1962–63. Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities. Root

255–56 *Secondary Education** (3–3)
Academic year—Saturday morning; summer 1962. *First half:* current proposals for the improvement of secondary education. *Second half:* current problems in each of the subject-matter fields. Johnson

259–60 *Secondary School Management** (3–3)
Academic year—Saturday morning. For experienced teachers and administrators

* Prerequisite: adequate professional preparation.

with two years of successful teaching in secondary schools. Management planning, execution, and control; criteria of good management; construction of the master schedule; leadership problems incident to the development of new policies and programs.

263–64 *Employee Training* (3–3) Root
Academic year—evening. *First half:* nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half:* administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265–66 *Teaching Secondary School English* (3–3) Lumsden
Not offered 1962–63. A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half:* communication skills—structural linguistics, composition, and speech. *Second half:* American and English literature.

267–68 *Teaching Secondary School Social Studies* (3–3) Whipple
Academic year—evening. A refresher course for teachers of the Social Studies. Discussion of new approaches to high school content. Offered in cooperation with the departments of History, Political Science, Geography, Economics, and Sociology and Anthropology.

271 *The Teacher and School Administration** (3) Fox
Fall—evening; summer 1962 (Carroll). A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

272 *The Teacher and School Supervision** (3) Fox
Spring—evening; summer 1962. Nature, organization, human relationships, and techniques.

273–74 *Teacher Education** (3–3) LaBue
Not offered 1962–63. *First half:* aims, objectives, and basic issues; study of outstanding and experimental programs. *Second half:* recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences.

275 *School Finance** (3) Hutchins
Summer 1962. Educational financial theory, practice, and control, including methods of financing.

276 *Seminar: Public Relations in School Administration** (3) Joy
Not offered 1962–63. Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

277 *Administration of School Personnel** (3) Carroll
Summer 1962. Techniques and problems of administration related to more effective service of staff personnel.

278 *School Law** (3) Remmlein
Summer 1962. Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.

279–80 *Adult Education** (3–3) Detwiler, Holden
Academic year—evening; summer 1962—Education 280 (3). *First half:* current concepts and objectives, agencies involved, programs on all levels—international through community. *Second half:* the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.

283–84 *Higher Education** (3–3) Jarman
Academic year—evening. *First half:* development, present status, and outlook for American colleges; purposes of higher education, current and projected programs; trends in curriculum, instruction, administration, and evaluation of outcomes. *Second*

* Prerequisite: adequate professional preparation

half: principles in development of college programs; study of curricula in liberal arts and professional fields; relationship of institutional services and facilities to the instructional program.

285 *Extra-classroom Activities** (3)

Not offered 1962–63. Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.

287–88 *Clinical Study of Reading Problems** (3–3) Coleman

Academic year—evening. For advanced students. Diagnostic and corrective work under supervision of the Reading Clinic. Each student is expected to diagnose and treat pupils who are retarded in reading. Case studies are presented and criticized. Prerequisite: Education 223–24 or the equivalent. Material fee, $5 a semester.

289 *Supervisory Problems in Reading** (3) Coleman

Not offered 1962–63. For experienced teachers, principals, supervisors, and superintendents. Considers the problems involved in planning, reorganizing, and improving the total reading program, in promoting cooperative effort on the part of the staff toward increasing teaching efficiency.

291 *Planning the School Plant* (3) Cameron

Not offered 1962–63. Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.

293–94 *Research* (3–3) The Staff

Academic year—as arranged. Individual research under the guidance of a member of the staff. Program and conferences arranged with an instructor.

295 *Educational Research Methods and Procedures* (3) LaBue

Fall—day; spring—evening; summer 1962. Required of all candidates for graduate degrees in Education. To be taken early in the student's graduate program. Prerequisite: an elementary course in statistics.

296 *Seminar in Educational Research* (3) LaBue

Spring—evening. Designed to help students analyze scientific approaches to problems in education; evaluate the application of research techniques to typical problems; define, organize, and conduct research studies; and prepare proposals for sponsored research. Required of all candidates for the Doctor of Education degree and open, with permission, to candidates for other advanced degrees. Prerequisite: Education 295 or the equivalent.

297 *Reading in Education* The Staff

Academic year—late afternoon; summer 1962. To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, $30.

299–300 *Thesis* (3–3) The Staff

Academic year—as arranged. Required of all Master of Arts candidates writing Master's theses.

ENGINEERING†

Professors C. H. Walther, M. A. Mason, R. A. Hechtman *(Chairman, Civil Engineering)*, P. A. Crafton, Louis delPian, N. T. Grisamore *(Chairman, Electrical Engineering)*, H. E. Smith, Ben Lindberg

Adjunct Professors L. A. Guildner, A. G. McNish, Gunther Sorger, Churchill Eisenhart, Theodore Young

* Prerequisite: adequate professional preparation.

† The Staff of Instruction here listed is for the academic year 1961–62.

Professorial Lecturers F. K. Harris, F. P. Hall, Laurence Heilprin, H. L. Stier, Ezra Glaser

Associate Professors John Kaye, G. M. Arkilic, A. C. Murdaugh, R. R. Fox, M. S. Ojalvo

Associate Professorial Lecturers K. W. Webb, M. J. Rosenbaum

Assistant Professors R. L. Dedrick, C. D. Ferris, E. H. Braun, R. E. Cronin, John Eftis

Lecturers George Abraham, W. W. Balwanz, P. H. Sawitz, L. S. Rotolo, J. A. Cunningham, Howard Eisner, Milton Gussow, D. C. Rohlfs, P. S. Morgan, Jr., Gershon Kulin

Instructors R. M. Moore, A. C. Meltzer, J. D. O'Neale, T. P. Carroll, D. K. Anand, Ronald Feit

Associate T. B. Wiggins

Civil Engineering

First Group

21 *Rigid Body Mechanics I* (3) The Staff

Fall—day and evening; spring—evening. An introduction to vector mechanics. Newton's Laws; equilibrium of a particle and systems of particles, rigid bodies, and systems of rigid bodies; kinematics. Prerequisite: Mathematics 31 or 24, Physics 14.

24 *Mechanics of Deformable Bodies I* (3) The Staff

Fall—evening; spring—day and evening. An introduction to elastic and inelastic behavior of solids acted upon by forces. Analysis of stress and strain at a point; stress-strain temperature relations; criteria for yielding; applications including tension, compression, torsion, bending, shear, and buckling. Prerequisite: Civil Engineering 21, Mathematics 31 or 24.

Second Group

112 *Surveying* (3) The Staff

Spring: lecture (2 hours), field work (2 hours)—Saturday. Plane surveying, including measurements, simple curves, and topographical surveying; space measurements; treatment of observational errors; earthwork computations; field astronomy. Prerequisite: Mathematics 31 or 24, Mechanical Engineering 10. Surveying fee, $13.

121 *Rigid Body Mechanics II* (3) The Staff

Fall—day and evening; spring—evening. Continuation of Civil Engineering 21. Kinematics and dynamics of a particle, systems of particles, and rigid bodies and their applications. Prerequisite: Civil Engineering 21, Mathematics 111.

125 *Engineering Materials* (4) Murdaugh and Staff

Fall: lecture and laboratory—day and evening. Mechanical and surface properties of engineering solids; relationships between the structure of a material and its mechanical and physical behavior; principles of the control of the properties of metals and nonmetallic solids. Prerequisite: Chemistry 12 or 14, Civil Engineering 24, Physics 16. Laboratory fee, $11.

126 *Soil Mechanics* (3)

1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Fox

Mechanical properties of soils; theory and applications of lateral earth pressure, bearing capacity, and settlement of foundations. Prerequisite: Civil Engineering 125, 137, 144.

132 *Fluid Mechanics* (3) Mason and Staff

Fall: lecture and laboratory—evening; spring: lecture and laboratory—day and evening. Development of the fundamental principles of flow of viscous and ideal compressible and incompressible fluids; dimensional analysis and model theory; laboratory work emphasizes principles, analysis of tests, and systematic observations of phenomena. Prerequisite: Civil Engineering 121, Mathematics 111, Mechanical Engineering 113. Laboratory fee, $11.

135 *Hydraulic Engineering* (3) The Staff
1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Applied theoretical fluid mechanics, pipe and open channel flow, hydroelectric development, drainage and irrigation, control of river flow and floods, water supply and sewerage. Prerequisite: Civil Engineering 137.

137 *Applied Earth Sciences* (3) Fox
1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Formation and properties of soils and rock, seismology, climatology, hydrology, ground water and river flow. Prerequisite: Civil Engineering 125, 132.

143–44 *Structural Theory I–II* (4–4) Hechtman, Walther
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Theory and structural behavior of statically determinate and indeterminate plane and space structures by classical and modern methods; introduction to matrix model analysis, plastic collapse, numerical methods, and matrix algebra methods. Prerequisite or concurrent registration: Civil Engineering 125, Mathematics 111. Laboratory fee, $11 a semester.

145 *Metal Structures* (3) Fox, Hechtman
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Application of structural theory and engineering materials to the analysis and design of metal structures under static and moving loads; plastic design, buckling. Prerequisite: Civil Engineering 144, 157.

146 *Reinforced Concrete* (3) Fox, Hechtman
1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Theory and design of plain and reinforced concrete structures including prestressed concrete and ultimate strength design. Prerequisite: Civil Engineering 144. Prerequisite or concurrent registration: Civil Engineering 157.

154 *Structural Dynamics* (3) Arkilic, Fox
1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Free, forced, steady state, and transient vibration of structural members and framed structures; earthquake, blast, and other dynamic loadings; methods of analysis including energy methods and applications of matrix algebra. Prerequisite: Civil Engineering 121, 144, Mathematics 111.

157 *Mechanics of Deformable Bodies II* (3) Fox, Walther
1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. An introduction to the advanced mechanics of deformable bodies including the theory of two-dimensional linear elasticity in cartesian and polar coordinates and the theory of perfectly plastic solids. Prerequisite: Civil Engineering 125, Mathematics 112. Prerequisite or concurrent registration: Civil Engineering 144 or Mechanical Engineering 123.

165 *Engineering Analysis and Planning* (3) The Staff
1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Mathematical analysis, planning, and economics of engineering problems and projects including modern computational methods. Prerequisite: senior standing in Civil Engineering.

166 *Transportation Engineering* (3) The Staff
Time to be arranged. Planning and systems analysis of transportation networks. Prerequisite: Civil Engineering 165.

168 *Regional and Urban Planning* (3) Ellis
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Regional and urban planning including engineering aspects in connection with transportation, water supply and sewerage, public safety, and convenience. Prerequisite: Civil Engineering 165.

195–96 *Problems in Civil Engineering* (arr.) The Staff
Academic year—as arranged. Special problems approved by the Staff. Prerequisite: senior standing.

THIRD GROUP

216 *Metal Structures* (3) Hechtman
Time to be arranged. Structural behavior and failure of metal structures; materials; residual stresses; analysis and design of connections and members; theory of plastic collapse of structures; plastic design.

217 *Ultimate Strength of Reinforced Concrete Structures* (3) Fox
Time to be arranged. Modes of failure of reinforced concrete structures; experimental data on failure; ultimate strength concepts for the analysis of beams, slabs, and columns.

218 *Prestressed Concrete Structures* (3) Hechtman
Time to be arranged. Structural behavior and failure of prestressed concrete structures; materials; theory, analysis, and design of prestressed concrete structures and members.

224 *Theory of Plates and Shells* (3) Arkilic
1962–63 and alternate years: spring—evening. Classical and modern theories of plates and shells, plates and cylindrical shells under different loadings and boundary conditions, equations for plates including shear, rotationally symmetric shells under small deformations and their applications.

226 *Plasticity of Solids* (3) Hechtman
1963–64 and alternate years: fall—evening. Plastic flow and fracture of solids; theory of elastic perfectly plastic solids, including basic concepts, limit analysis of beams, rigid frames, and plane stress problems; theory of fracture.

234 *Geotechnics in Soil Mechanics* (3) Fox
1962–63 and alternate years: fall—evening. Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action.

235 *Theoretical Soil Mechanics* (3) Fox
1962–63 and alternate years: spring—evening. Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics.

238 *Foundation Engineering* (3) Fox
Time to be arranged. Principles of soil mechanics and structural mechanics in the analysis and design of spread footings, mat and pile foundations, retaining walls, sheet piling and water front structures.

251 *Theory of Structures I* (3) Fox, Hechtman
Fall—evening. Classical and modern theories for plane statically indeterminate structures, matrix analysis of structures, special problems.

252 *Space Structures* (3) Hechtman
Spring—evening. Theory of structures in three dimensions; trusses, rigid frames, and thin-shell structures; matrix analysis and applications of computers.

253 *Theory of Structures II* (3) Hechtman
Time to be arranged. Statically indeterminate structural theory, including single and multi-span rigid frames and arches, deflection theory for arches and suspension bridges, thermal stress, and failure of structures.

254 *Theory of Structural Dynamics* (3) Arkilic
1963–64 and alternate years: spring—evening. Analysis of elastic structures under various dynamic loadings, both steady-state and transient, including vibrations of rigid frames, plates, and thin shells.

256 *Theory of Elastic Stability* (3) Hechtman
1962–63 and alternate years: fall—evening. Beam-column problems and methods of analysis (including numerical analysis); lateral buckling of beams; buckling of rigid frames, arches, plates, stiffened plates, and shells; inelastic buckling.

272 *Experimental Structural Analysis* (3) Hechtman
Time to be arranged. Experimental analysis of truss, rigid frame, plate, and shell structures; large- and small-deflection models; similitude.

275 *Concepts of Structural Design* (3) Hechtman
Time to be arranged. Mechanical behavior and failure of structures as determined by properties of materials, nature of structure, and type of loading; selection of type of structure; structural analysis, its applications and possible simplifications.

295–96 *Research* (arr.) The Staff
Academic year—as arranged. Research or directed study.

Electrical Engineering

First Group

11–12 *Fundamentals of Electrical Engineering* (3–3) The Staff
Academic year—day and evening. Electric and magnetic fields, d-c and a-c electrical circuits and networks, energy sources, electromechanical energy conversion, power, electronic devices, and circuits. *First half:* circuits and electronics. *Second half:* energy, power, and fields. Prerequisite to Electrical Engineering 11: Physics 15 and Mathematics 111 or concurrent registration. Prerequisite to Electrical Engineering 12: Electrical Engineering 11.

Second Group

102 *Engineering Electronics I* (3) Braun
Fall—day and evening. Vacuum tube and solid state devices as circuit elements, equivalent circuits, voltage and power amplifiers. Emphasis placed on design of electronic circuits. Prerequisite: Electrical Engineering 12, Mathematics 112.

103 *Electric and Magnetic Fields* (3) deFian
Fall—day and evening. Introduction to vector analysis and its application to static electric and magnetic fields; method of images, solid angle, particle motion in electric and magnetic fields. Prerequisite: Electrical Engineering 12, Mathematics 112.

104 *Field Analysis* (3) Ferris
Spring—day and evening. Vector potential, magnetic scalar potential, conformal mapping, solutions of Laplace's equation, field plotting, analogues. Introduction to Maxwell's equations and electromagnetic waves. Prerequisite: Electrical Engineering 103, Mathematics 112.

107 *Steady-state Network Analysis* (3) Ferris
Fall—day and evening. Four-terminal networks, network theorems, poles and zeros of network functions, resonance, filters, coupled circuits, transmission lines. Fourier series, matrices. Prerequisite: Electrical Engineering 11, Mathematics 112.

111 *Electrical Measurements* (3) Meltzer
Fall—day and evening. Systems of units; theory of errors; d-c indicating instruments and galvanometer dynamics; precision measurement of voltage, current, and resistance. Theory of a-c indicating instruments, a-c bridges, waveforms, frequency measurements, measurement of power and energy. Prerequisite: Electrical Engineering 12, Mathematics 112.

113 *Electrical Engineering Laboratory I* (2) Meltzer
Fall—day and evening. Experiments in d-c and a-c circuits, instruments, and machines. Prerequisite: Electrical Engineering 12, Mathematics 112. Laboratory fee, $11

118 *Electrical Energy Conversion* (3) Meltzer
Spring—day and evening. Analysis of physical systems involving electrical, mechanical, and thermal energy conversion; mathematical formulations using the Euler-Lagrange equation; transient and steady-state analysis of special machines including the generalized rotating energy converter. Prerequisite: Electrical Engineering 12, Mathematics 112. Prerequisite or concurrent registration: Electrical Engineering 104, 112.

122 *Electrical Engineering Laboratory II* (2) Meltzer, Rohlfs
Spring—day and evening. Continuation of Electrical Engineering 113. Measurement of electrical quantities, design and construction of laboratory circuits. Prerequisite: Electrical Engineering 102, 103, 107, 111, 113. Laboratory fee, $11.

123–24 *Electrical Engineering Laboratory III–IV* (2–2) Meltzer, Rohlfs
Academic year—day and evening. *First half:* theory and use of electronic devices and instruments. Experiments at radio- and microwave frequencies. Prerequisite to 123: Electrical Engineering 122 and senior status. *Second half:* Creative projects in electrical and electromechanical devices and systems carried out under individual supervision. Prerequisite to 124: Electrical Engineering 123. Laboratory fee, $11 a semester.

127 *General Network Analysis* (3) Ferris
Fall—day and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeroes of network functions, correlation of time and frequency domains, elements of network synthesis. Prerequisite: Electrical Engineering 107, Mathematics 112.

133 *Engineering Analysis* (3) dePian
Fall—day. Application of fundamental principles of engineering, physics, and mathematics to problems in various fields of engineering. Emphasis is placed on problem solving using concepts previously studied. Prerequisite: Civil Engineering 121, Electrical Engineering 102, Mathematics 112, Physics 16.

134 *Engineering Electronics II* (3) Braun
Spring—day and evening. Continuation of Electrical Engineering 102. Feedback amplifiers, oscillators, relaxation circuits, computing circuits, modulation. Prerequisite: Electrical Engineering 102.

136 *Electromagnetic Waves* (3) Ferris
Spring—day and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices. Prerequisite: Electrical Engineering 104, Mathematics 112.

137 *Active Network Theory* (3) dePian
Fall—day and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems. Prerequisite: Electrical Engineering 102 or Physics 132, Electrical Engineering 107, Mathematics 112.

142 *Information Theory* (3) Grisamore
Spring—day and evening. Introduction to probability. Discrete and continuous information sources. Coding, transmission, channel capacity, correlation function. Noise in information systems. Prerequisites: Mathematics 112 and senior status.

171 *Digital Circuitry and Systems* (3) Grisamore, Rotolo
Fall—day. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 134 or Physics 132.

172 *Digital Techniques* (3) Rotolo
Spring—day. Continuation of Electrical Engineering 171. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams. Prerequisite: Electrical Engineering 171.

Wiggins

174 *Digital and Analog Computer Laboratory* (2)
Spring—day. Theory and use of digital and analog computers: programming, operating, logical circuitry, design, troubleshooting. Prerequisite: Electrical Engineering 134, 171. Laboratory fee, $11.

THIRD GROUP

Sawitz

201 *General Network Analysis* (3)
Spring—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, elements of network synthesis.

dePian

202 *Advanced Network Analysis* (3)
Fall—evening. Advanced theory of lumped and distributed linear networks, matrices, stability, activity.

dePian

203 *Network Synthesis* (3)
Spring—evening. Basic techniques in the synthesis of linear two- and three-terminal passive networks; positive real functions; Foster, Cauer, Brune, Bott-Duffin, Darlington procedures; elements of active network synthesis.

Braun

211 *Electromagnetic Waves* (3)
Fall—day and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices.

Ferris

212 *Field Analysis and Potential Theory* (3)
Spring—evening. Fields of force, divergence, Newtonian potentials at points of free space, solutions of Laplace's equation, harmonic functions, logarithmic potential

dePian

213 *Microwaves* (3)
Fall—evening. Transmission lines; waveguides; antennas; resonators; amplifiers and oscillators; klystrons, magnetrons, traveling wave tubes.

214 *Electrodynamics* (3)
Spring—evening. Presence of moving matter in electromagnetic fields, force and energy in moving systems, relativistic concepts, tensors.

215 *Antennas* (3)
Fall—evening. Maxwell's equations, radiation, impedance, directional characteristics, arrays, aperture antennas.

dePian

221 *Active Network Theory* (3)
Fall—day and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems.

Braun

222 *Physical Electronics* (3)
Spring—evening. Physical principles underlying operation of various electronic devices including vacuum tubes, electron lenses, transistors, and recent solid-state electronic devices.

223 *High-frequency Electronics* (3)
Fall—evening. High frequency operation of electron tubes and semiconductor devices, transit time, bunching, pulse techniques.

224 *Industrial Electronics* (3)
Spring—evening. Gaseous tubes and applications; rectifiers; timing circuits; induction and dielectric heating; regulation and control, magnetic amplifiers.

Ferris

225 *Electronic Measurements in Psychometrics and Medicine* (3)
Fall—evening. Theory of measurements in biological areas, field and circuit theory as a foundation for measurements, techniques for electronic measurements on biological specimens, problems in medicine and psychology with emphasis on measurements and measuring devices.

226 *Physical Basis for Medical Electronics* (3) Ferris
Spring—evening. Electrical and acoustical properties of biological material; structural components of biological material as they affect its dielectric and acoustical behavior, electrical relaxation phenomena in general and their application to biological material in particular, applications in diathermy and electrocardiography, impedance determination.

231 *Digital Circuitry and Systems* (3) Wiggins
Fall—day. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits.

232 *Digital Techniques* (3) Rotolo
Spring—day. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams.

233 *Digital Systems* (3) Cunningham
Fall—evening. The programmed system; system design of digital computers, special-purpose digital computers, reliability, data-processing techniques, analog-to-digital and digital-to-analog techniques.

234 *Automata and Self-organizing Systems* (3) Grisamore
Spring—evening. Effectively computable functions and Turing machines, digital computational methods in Boolean algebra, combinational circuits and their analysis, recursion circuits and their analysis, reliability of automata, networks of automata, artificial intelligence.

241 *Analysis of Modulation and Noise* (3) Grisamore
Fall—evening. Analysis by Fourier series and integrals of signals and linear networks, modulation and spectra, noise analysis including probability method of determining power spectra.

242 *Information Theory* (3) Eisner
Spring—evening. Discrete and continuous systems; ergodic ensembles and random processes; correlations, filtering, prediction; redundancy.

243 *Electromagnetic Wave Propagation* (3) _____
Fall—evening. Ground waves; space-wave propagation, atmospheric effects, ionosphere; maximum usable frequency; bandwidth.

244 *Communication Systems* (3) _____
Spring—evening. Radar; television; ultra-high frequency; navigational aids.

251 *Power Transmission* (3) Meltzer
Fall—evening. Transmission lines, exact and approximate equivalent circuits, standing waves, filtering, protection, radio interference, high voltage, line configurations.

252 *Power Generation* (3) Meltzer
Spring—evening. Steam, hydroelectric and nuclear plants, fuel cells and magnetohydrodynamics, efficiency, reheat cycles, stability, load factors, generator swings.

253 *Power Systems* (3) Meltzer
Fall—evening. Substations, transformers, distribution, networks; short and open circuit analysis; symmetrical components; stability; network analysers.

Engineering Administration

The School of Engineering offers the following courses primarily for candidates for the degree of Master of Engineering Administration. Other courses listed in this program are offered by the departments of Accounting, Business and Public Administration, Psychology, and Statistics.

THIRD GROUP

201 *Engineering Administration I* (3) Cronin and Staff

Fall—evening; spring—evening. The application of scientific method to the (1) planning element and (2) organizing element of the administrative process. Characteristics of plans, establishing objectives and goals, determining policies and procedures, preparing plans to meet stated objectives and goals, organization for planning, testing of plans. Characteristics of organization, patterns of departmentation authority, responsibility, levels of specialization, coordination, decentralization, work division, staff, committees. Introduction to analysis for decision making.

202 *Engineering Administration II* (3) Cronin and Staff

Fall—evening; spring—day and evening. Sequential to Engineering Administration I. The application of scientific method to the (3) directing or managing element and (4) control element of the administrative process. Personnel management, organized labor, executive leadership, communication, implications of automation, systems analysis for effective administration. Methods of evaluation and control of operations, cost-financial analysis, budgeting, administrative audits.

204 *Administration of Engineering Contracts* (3)

Fall—evening. Study of types of contracts, proposal preparation, evaluating contracts, negotiating contracts, determining allowable costs, contract auditing, renegotiation, contract extension policies and procedures, appraisal of capabilities of contractors.

207 *Personnel Administration* (3) Lindberg, Cronin

Fall—evening; spring—evening. Study of personnel functions with emphasis on relationships within organizations which utilize the services of engineers and scientists: employment, health, safety, education and training, financial compensation, union relations, collateral benefits and services, human relations and personnel research practices in engineering and industry.

210 *Engineering Law* (3)

Spring—evening. Legal principles and procedures of interest to engineers, the American Legal System, contracts and specifications, liability of professional engineers, antitrust problems, agency relationships, negotiable instruments, patent and proprietary rights, special problems in research and development contracts.

253 *Management of Production Processes and Facilities* (3) Smith

Fall—evening; spring—evening. Planning, organizing, and control of production; forecasting techniques; material management; methods of loading and scheduling production processes; electronic methods in production control. Organization and administration of the plant engineering function with emphasis on maintenance control programs.

254 *Principles and Procedures of Automatic Data Processing Systems* (3)

Fall—evening; spring—evening. Logic of computers, arithmetic and control units, computers as systems analysis for data processing applications, systems design, systems economics, relation to scientific decision processes.

255 *Administration of Research and Development* (3) Lindberg

Fall—evening; spring—evening. Contemporary practices of administrators of scientific and engineering research and development for the purpose of finding uniformities, characteristics, and conceptual schemes; relation of such findings to accepted managerial concepts, and projection of their implications on contemporary managerial hierarchies and organizational structures.

261 *Economic Analysis in Engineering Planning* (3) Lindberg

Fall—evening; spring—evening. Important concepts and theories employed in economic analysis of engineering projects. Application of tools and techniques used in various analytic processes. Detailed practice in pursuit of solutions to, and adjustment of, persistent and current problems in this field

263 *Quantitative Techniques of Engineering Administration* (3) Glaser
Spring—evening. Application of the various quantitative techniques, mathematical, statistical, and other management sciences' techniques to the analysis of engineering administration and the solution of administrative problems by the use of models, theories, and measurements.

271 *Operations Research* (3) Kaye, Webb
Fall—evening; spring—evening. Background and application of operations research; history, characteristics, capabilities, administrative considerations, methods, and techniques, including construction of conceptual and mathematical models. Prerequisite: Mathematics 31 or 24, Statistics 107, or permission of the instructor.

272 *Problems in Operations Research* (3) Kaye
Spring—evening. Field experience in operations research on a team basis. Each small group locates an actual problem and formulates and solves it by operations research methods. Class evaluation of progress. Prerequisite: Engineering Administration 271.

275 *Linear Programming* (3) ———
Fall—evening; spring—evening. The basic computational, theoretical, and applied areas with emphasis on the general linear programming problem; simplex computational procedure; duality; transportation and assignment problems; production scheduling problem; zero-sum two-person games; and additional applications and recent developments. Prerequisite: Engineering Administration 271.

276 *Theory of Games* (3) ———
Fall—evening. Study of mathematical models with applications to the relationships among independent competitive entities (persons or organizations in environment of competition, bargaining, bidding), selection of optimum strategies, mixed strategies, minimax concept, connections with linear programming and decision functions, two-person and n-person zero and nonzero sum games. Prerequisite: Engineering Administration 271.

277 *Queuing Theory* (3) ———
Spring—evening. Study and analysis of operational systems with variables in arrivals and service, Monte Carlo analysis, optimization methods. Prerequisite: Engineering Administration 271.

285 *Seminar in Administrative Problems* (3) Smith
Fall—evening; spring—evening. Individual analysis of complex administrative problems, with group evaluation and discussion. Prerequisite: admission to candidacy and completion of at least 18 semester hours of graduate study.

295 *Applied Research in Engineering Administration* (arr.) Smith, Lindberg
Fall—as arranged. Application of established principles to new engineering administrative situations; the development of new knowledge of administration. Prerequisite: approval of the instructor.

296 *Research in Engineering Administration* (arr.) ———
Fall—as arranged; spring—as arranged. Creative thinking in engineering administration, initiation of new theories and principles, development of new hypotheses, experimentation, proof of theories and hypotheses. Prerequisite: approval of the instructor.

299-300 *Thesis* (3-3)
Academic year—as arranged.

Engineering Science

Second Group

The following courses serve as foundations for specialization, since they are concerned with a body of knowledge applicable in a variety of engineering fields.

130 *Introductory Astronomy* (3) Grisamore

Spring—evening. Coordinate systems and nomenclature used in astronomy, description of astronomical systems from solar system to metagalaxies, introduction to celestial mechanics, types of stars, stellar physics. Prerequisites: integral calculus and one year of college physics.

154 *Automatic Control** (4) Crafton, dePiro

Spring—day and evening. Theory of automatic control systems including electromechanical, pneumatic, and hydraulic systems. Transient analysis, transfer functions, stability criteria. Experimental study of automatic control systems. Lecture and laboratory. Prerequisite: Electrical Engineering 127 or Mechanical Engineering 125. Laboratory fee, $11.

THIRD GROUP

201 *Automatic Control* (3) Crafton

Fall—evening. Advanced theory of automatic control. Systems analysis, multiple-loop systems, nonlinear systems.

211 *Mathematical Methods in Engineering I* (3) Arkilic, Braun

Fall—day and evening; spring—evening. A course in such topics as functions of complex variables, infinite series, linear vector spaces and matrices, and partial differential equations. The required level of preparation is equivalent to Mathematics 111 and 112 as given at this University.

212 *Mathematical Methods in Engineering II* (3) Arkilic, Braun

Fall—evening; spring—evening. Continuation of Engineering Science 211. Mathematical topics include: introduction to tensor analysis, calculus of variations, finite differences, and integral equations.

216 *Advanced Dynamics* (3) Crafton

Time to be arranged. Dynamics of continuous mechanical systems; Lagrange's equations, Hamilton's principle, gyrodynamics; operational methods. Prerequisite: permission of the instructor.

217 *Analytical Mechanics* (3) Crafton

Fall—evening; spring—evening. Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations.

218 *Mechanics of Orbits and Trajectories* (3) Crafton

1962–63 and alternate years: fall—evening. Celestial mechanics. Orbits and trajectories in force fields. Dynamics of space vehicles.

219 *Mechanics of Continua* (3) Arkilic

Time to be arranged. Mechanics of elastic, plastic, and viscous solids and of fluids; introduction to theory and formulation of basic equations.

220 *Nonlinear Mechanics* (3) Crafton

Spring—evening. Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations.

221 *Theory of Elasticity I* (3) Arkilic

Spring—evening. Introduction to mathematical theory of elasticity, analysis of strain and stress, generalized Hooke's law, equilibrium equations, Beltrami-Michell equations, strain energy functions, torsion, general flexure.

222 *Theory of Elasticity II* (3) Arkilic

1962–63 and alternate years: fall—evening. First and second boundary-value problems in plane elasticity, uniqueness of solutions, simply and multiply connected regions, three-dimensional problems, thermoelasticity, vibration of elastic solids, variational methods.

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies

223 *Celestial Mechanics* (3) Crafton
Time to be arranged. General equations of motion; Lagrange's planetary equations; disturbing function; Delaunay and Poincaré variables; secular inequalities; lunar theory; precession and nutation.

227 *Experimental Stress Analysis* (3) Walther
Time to be arranged. Applications of the theory of elasticity in the analysis of strain and stress; theory of gaging for static and dynamic strain and stress measurements.

230 *Dynamics of Compressible Fluids* (3) Ojalvo
Time to be arranged. Mathematical theory of compressible fluid flow and thermodynamics of compressible fluids. Prerequisite: permission of the instructor.

231 *Fluid Dynamics* (3) Ojalvo
Fall—evening. Theory of compressible and incompressible fluid motion including potential motion, circulation and vorticity, mathematical treatment of flow at sub-, trans-, and supersonic velocities, normal and oblique shock, and elements of heat transfer.

233 *Engineering Problems* (3) dePian
Spring—evening. Investigation of problems in engineering science, emphasizing imaginative and systematic application of fundamental principles in engineering, physics, and mathematics.

241 *Science of Engineering Materials* (3) Murdaugh
1963–64 and alternate years: fall—evening. Relation of the atomic and microscopic structure of engineering materials to their physical and mechanical properties and their mechanical behavior in engineering applications.

251 *Magnetohydrodynamics* (3) Grisamore
Time to be arranged. Study of the interaction of electromagnetic and fluid fields. Dynamics of conducting fluids in electromagnetic and magnetic fields.

299, 300 *Thesis* (3–3)
Academic year—as arranged.

Mechanical Engineering

First Group

9 *Introduction to Engineering** (3) The Staff
Fall—day and evening; spring—evening. Number systems, computation aids, scientific method, problem solving techniques, use of mathematical tables. Emphasis is placed on the development of sound reasoning and study methods.

10 *Graphical Communication* (2) The Staff
Fall—evening; spring—day and evening. Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course. Laboratory fee, $10.

Second Group

100 *Analytical Kinematics* (3) O'Neale
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Theoretical study of the motion of constrained and unconstrained rigid bodies. Prerequisite or concurrent registration: Civil Engineering 121, Mathematics 112.

113 *Thermodynamics I* (3) Dedrick
Fall—day and evening. Theoretical study of fundamental concepts, equations of state, first and second laws of thermodynamics, entropy, single and two-phase mixtures. Prerequisite: Chemistry 12 or 14, Mathematics 111, Physics 16.

* This course should be completed before the beginning of the sophomore year.

114 *Thermodynamics II* (3) Ojalvo, Dedrick

Spring—day. Theoretical study of vapor cycles, combustion, gas dynamics, equilibrium, multiphase mixtures. Prerequisite: Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132, Mechanical Engineering 118.

118 *Heat Transfer* (3) Ojalvo, Dedrick

Spring—day and evening. Heat transfer theory, conduction, convection, radiation, field and potential theory applied to conduction. Prerequisite: Mathematics 112, Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132.

120 *Physical Metallurgy* (3) Murdaugh

1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Physics of metals, crystal and lattice structures, binary and ternary alloys, properties of alloys, nonequilibrium conditions, phase diagrams. Lecture and laboratory. Prerequisite: Civil Engineering 125, Mathematics 31 or 24. Laboratory fee, $10.

123 *Advanced Dynamics I* (3) Crafton

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Shock and vibrations in linear mechanical systems, elctromechanical analogies, transient and steady-state analysis. Prerequisite: Mechanical Engineering 100. Prerequisite or concurrent registration: Civil Engineering 157.

124 *Advanced Dynamics II* (3) Crafton

1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Advanced study of dynamics of continuous mechanical systems. Lagrange's equations, Hamilton's principle, gyrodynamics. Prerequisite: Mechanical Engineering 123.

135–36 *Thermal Power* (3–3) Ojalvo

1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Analysis and design principles governing systems and components in heat-power, gas and vapor turbines, internal combustion engines, heat pumps, nuclear power systems. Lecture and laboratory. Prerequisite: Civil Engineering 132; Mechanical Engineering 114, 118; Physics 191. Prerequisite or concurrent registration: Mechanical Engineering 139. Laboratory fee, $15 a semester.

139 *Fluid Machinery* (3) Dedrick

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. General theory of dynamic machines; velocity diagrams and work transfer; radial, axial, and mixed-flow machines; torque converters and couplings; jet machines. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Prerequisite or concurrent registration: Mechanical Engineering 123. Laboratory fee, $10.

143 *Production Analysis* (3) Kaye

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Principles of schematic models, mathematical programming, quality control, operations analysis. Prerequisite: Mathematics 112.

146 *Dynamics of Compressible Fluids* (3) Dedrick

1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Mathematical theory of compressible fluid flow, flow around immersed bodies, airfoil theory, shock wave theory, thermodynamics of compressible fluids. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 118. Laboratory fee, $10.

195–96 *Special Topics in Mechanical Engineering* (arr.)

Academic year—as arranged. Special problems approved by the Staff. May be substituted for required senior courses. Prerequisite: senior status and approval of the instructor.

THIRD GROUP

211 *Thermodynamics* (3) Ojalvo

Fall—evening. Reversible and irreversible processes, equilibrium, ideal and van der

Waal's gases, dilute solutions, phase equilibria, electric and magnetic effects, radiation. Introduction to kinetic theory and statistical mechanics.

213 *Heat Transfer* (3) Ojalvo

Spring—evening. Physical and mathematical concepts of heat transfer phenomena under steady and unsteady conditions, including: Stefan-Boltzmann and Planck laws for radiation, Fourier heat equation for conduction, dimensional analysis, and boundary layer theory for convection.

215 *Gas Dynamics* (3) Ojalvo

Spring—evening. Theory of gas dynamics including: combustion, shock phenomena, dynamics of flow, and heat transfer for high temperature gases.

235 *Hypersonic Fluid Dynamics* (3)

Time to be arranged. Small disturbance theory; Newtonian theory; constant-density solutions; thin shock layers; viscous interactions; free molecule and rarefied gas flows.

255 *Combustion Processes* (3) Dedrick

Time to be arranged. Thermodynamics of combustion; chemical kinetics; flame propagation; combustion of liquids and solids; detonation processes.

256 *Reaction Kinetics* (3) Dedrick

Time to be arranged. Theoretical aspects of kinetics of homogeneous and heterogeneous reactions in gaseous and liquid systems.

Metrology*

First Group

4 *Introduction to Statistics for Metrology* (3) McNish

Measurement—qualitative and quantitative aspects. The role of corrections. Measurement as a production process. Errors, limiting mean, true value, precision, and accuracy. Classification of errors; statistical tools for the detection and diagnosis of errors. Quality control of measurement processes. Measurement of the precision and assessment of the accuracy of a measurement process. Expression of the uncertainties affecting a measured value. Prerequisite: Mathematics 31 or 24, and a laboratory course in physical science or engineering.

5–6 *Foundations of Metrology I–II* (5–4) (NBS) McNish

Origin and development of standards, relative and absolute measurements, systematic and random errors, comparison and dissemination of standards, effective design of experiments, translation of standards to manufacturing. Use of standard devices for measurement of length, time, speed, force, weight, mass, density, specific gravity; calibrations. Fluid flow and electrical measurements; measurements involving use of several instruments. Prerequisite: Mathematics 31 or 24, Physics 14.

Second Group

111–12 *Precise Electrical Measurements I–II* (3–3) (NBS) Harris

Electrical measurements from direct current through radio frequencies. Units and dimensional systems; techniques of substitution and comparison; transfer techniques; ratio techniques; detectors; bridges; measurement of current, voltage, power, resistance, capacitance, inductance, energy, phase angle, frequency, and time; dielectric and magnetic measurements; special topics in high-frequency measurements; field strength, signal-to-noise ratio, impedance, attenuation. Prerequisite: Electrical Engineering 102, 104, and Mathematics 111, or the equivalent.

113 *Introduction to Transducers and Instrumentation* (2) Moore

Theory and application of simple transducers; techniques in instrumentation of systems of one type (electrical, electronic, fluid, mechanical, optical, acoustical, nuclear); analysis and design of simple instrumentation systems, with emphasis on the precision and accuracy of measurement. Prerequisite: Electrical Engineering 102, Mathematics 111, Metrology 6, or the equivalent.

* NBS in parentheses indicates courses which will be taught at the National Bureau of Standards.

Moore

114 *Advanced Transducers and Instrumentation* (3)
Advanced study of practical transducers and instrumentation; theory and applications of advanced transducers in instrumentation problems involving measurements on systems containing multiple quantities of one type or mixture of types (such as electrical, electrical-electronic, fluid, fluid-mechanical-acoustical, etc.), with emphasis on optimal instrumentation for precision measurement. Prerequisite: Metrology 113 or graduate status.

Young

121 *Precise Mechanical Measurements* (4) (NBS)
Measurements of mass, time, weight; visual, mechanical, length, and interferometric methods; density, force, pressure, vibration, acceleration, flow, and viscosity measurements. Prerequisite: Metrology 4, 5, or the equivalent.

Guildner

131 *Precise Heat Measurements* (4) (NBS)
Temperature measurement, the thermodynamic and international temperature scales; resistance thermometry, thermocouples, and pyrometry. Vapor pressure thermometry and other techniques for low-temperature measurement. Heat transfer quantities and their measurement, conduction, convection, and radiation. Calorimetry; isothermal and adiabatic calorimeters, flow calorimeters; types of heat quantities measured by calorimetry. Prerequisite: Metrology 4, 5, 111, or the equivalent.

Third Group

McNish

201 *Advanced General Metrology* (3)

Eisenhart

203–4 *Probability and Statistics of Metrology I–II* (3–3)
Probability distributions, discrete and continuous distributions; sampling; combinational analysis; stochastic processes; conditional probability; correlation; analysis of variance; design and analysis of experiments, Latin Square experiments, factorial experiments, block and lattice designs. Prerequisite: Metrology 4 or the equivalent and graduate status.

Sorger

214 *Microwave Measurements* (3)
Measurement of power, frequency, impedance, wavelength, and attenuation at microwave frequencies. Characteristics and Q of resonant devices. Prerequisite: Electrical Engineering 104 or the equivalent and graduate status.

220 *Precise Optical Measurements* (3)
Optical constants of lens systems; aberration; resolving power; illumination in focal plane; image evaluations, magnification, index of refraction; color and color temperature.

ENGLISH*

Professors E. S. Shepard, F. S. Tupper, C. D. Linton, C. W. Cole *(Chairman)*, R. H. Moore, J. H. Coberly, P. H. Highfill, Jr.
Associate Professors W. L. Turner, Muriel McClanahan, J. G. Allee, Jr., J. P. Reesing, Jr., R. H. Walker, Jr.
Assistant Professors R. E. Gajdusek, Elizabeth Wright, Nancy Tischler, J. G. Sweeney, M. E. Lyon
Instructors Jane Bauman, R. C. Rutledge, E. N. Harbert

* The Staff of Instruction here listed is for the academic year 1961-62.

ENGLISH COMPOSITION*

First Group

A *English for Foreign Students* (3) Allee and Staff
Fall—day and evening; spring—day and evening; summer 1962. A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B *English for Foreign Students* (3) Allee and Staff
Fall—evening; spring—day and evening. For second semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

1 *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. Review of grammar, exercises in composition, readings.

1X *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is $115 (the regular fee of $30 a semester hour, plus an additional fee of $25).

2 *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. For second-semester freshmen not following the Columbian College of Arts and Sciences sequence. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X.

4 *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. The second half of the six-hour English Composition course required of students in Columbian College. A course in critical analysis and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X and both semesters of one of the introductory literature courses.

11 *The Writing of Reports* (3) Turner and Staff
Fall—day and evening; spring—day and evening; summer 1962. Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X, and 2 or 4.

Second Group

109 *Expository Writing* (3) McClanahan and Staff
Fall—evening. A study of types of expository writing with weekly exercises. Prerequisite: English 1 or 1X, and 2 or 4.

113 *Narrative Writing* (3) Gajdusek
Fall—evening. Study of the techniques of narrative writing and class criticism of student writing. Prerequisite: English 1 or 1X, and 2 or 4.

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* Before students are registered in English 1 they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.
All students enrolled in curricula leading to bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, English 2 or 4. Successful completion of one of the introductory literature courses and English 1 or 1X is prerequisite to all other courses in English. English 2 is the second half of the first-semester composition course requirement of students not required to follow the Columbian College of Arts and Sciences sequence.

114 *The Writing of Fiction—the Short Story* (3) Gajdusek
Spring—evening. Prerequisite: English 113; consent of instructor.

116 *Advanced Exposition* (3) Moore
Not offered 1962–63. Theory and practice in the writing of expository articles and essays. Prerequisite: English 109; consent of instructor.

117–18 *The Writing of Fiction—the Novel* (3–3) Gajdusek
Academic year—evening. Writing a novel. Prerequisite: English 114; consent of instructor.

ENGLISH LITERATURE

First Group

51–52 *Introduction to English Literature** (3–3) Tupper and Staff
Academic year—day and evening; summer 1962. A historical survey. Prerequisite: English 1 or 1X.

91–92 *Introduction to European Literature** (3–3) Shepard and Staff
Academic year—day and evening. Consideration of various types. Prerequisite: English 1 or 1X.

Second Group*

121–22 *English Literature from the Beginnings to 1500* (3–3) Allee
First half: not offered 1962–63. *Second half:* spring—evening; summer 1962. *First half:* English literature prior to Chaucer. *Second half:* Chaucer.

125 *Introduction to English Linguistics* (3) Allee
Fall—evening. The development of the English language in a historical treatment of English grammar.

129–30 *Elizabethan Nondramatic Literature* (3–3) Tupper
Academic year—day. Nondramatic literature from 1485 to 1601.

135–36 *Shakespeare* (3–3) Tupper
Academic year—day.

139–40 *The Seventeenth Century* (3–3) Linton, Reesing
Academic year—evening; summer 1962—English 139 (3). *First half:* poetry and prose from 1603 to 1660. *Second half:* Milton.

141–42 *The Neoclassical Movement* (3–3) Highhill
Academic year—day. Poetry and prose from 1660 through the mid-18th century.

151–52 *The Romantic Movement* (3–3) Reesing
Not offered 1962–63. From the mid-18th century through Shelley and Keats.

161–62 *Victorian Literature* (3–3) Shepard
Academic year—day. Poetry and prose from 1830 to 1900.

165–66 *The Twentieth Century* (3–3) Linton
Academic year—day; summer 1962—English 166 (3). British poetry, prose, and drama since 1900.

181–82 *The English Novel* (3–3) Reesing
Academic year—day. Major English novelists from the 18th century to the present day.

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* All students enrolled in curricula leading to Bachelor's degrees in Columbian College who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.

English 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second-group courses except English 125.

183–84 *The English Drama* (3–3) Highfill
Academic year—evening. *First half:* concerned principally with the drama of Shakespeare's contemporaries. *Second half:* a historical survey from 1660 to the present day.

192 *Medieval Legend and Saga* (3) Allee
Not offered 1962–63. Celtic and Norse.

199–200 *Proseminar: Readings for the English Literature Major* (3–3) Tupper, Highfill
Academic year—day and evening. Conferences and group discussions.

THIRD GROUP

222 *The Age of Chaucer* (3)
Not offered 1962–63.

223–24 *Old English* (3–3) Allee
Academic year—evening. English language and literature before 1100. *First half:* Old English grammar and readings. *Second half:* Beowulf.

225 *Applied Linguistics* (3) Allee
Not offered 1962–63. Survey of the English language since 1850; introduction to analytical methods of structural linguistics and their application to modern American and British writing and to secondary school teaching of English.

235–36 *Studies in Shakespeare and His Contemporaries* (3–3) Tupper
Summer 1962—English 236 (3). Prerequisite: English 135–36.

239–40 *Studies in Seventeenth Century Literature* (3–3) Reesing
Not offered 1962–63. Open to qualified undergraduates. *First half:* chief figures exclusive of Milton. *Second half:* Milton.

241–42 *Studies in Neoclassical Literature* (3–3) Highfill
Not offered 1962–63. Prerequisite: English 141–42.

251–52 *Studies in the Romantic Movement* (3–3) Reesing
Not offered 1962–63. Prerequisite: English 151–52.

261–62 *Studies in Victorian Literature* (3–3) Shepard
Not offered 1962–63. Prerequisite: English 161–62.

265–66 *Studies in Twentieth Century Literature* (3–3) Linton
Not offered 1962–63. Eliot and his contemporaries.

295–96 *Studies in the History of English Literary Criticism* (3–3) Shepard
Academic year—evening. Open to undergraduates with the approval of the instructor.

299–300 *Thesis* (3–3) The Staff

AMERICAN LITERATURE

FIRST GROUP

71–72 *Introduction to American Literature** (3–3) Cole and Staff
Academic year—day and evening; summer 1962. A historical survey. *First half:* from the beginnings to the Civil War. *Second half:* from the Civil War to the present. Prerequisite: English 1 or 1X.

* All students enrolled in curricula leading to Bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, 2 or 2X, transfers of one of the introductory literature courses, and English 4.
Credit: transfers of one of the introductory literature courses, and English 4.
English 71–72, 71–72, 91–92, Classical Languages 51–52, French 51–52, German 51–52, Slavic Languages 51–52, or Spanish 51–52 is prerequisite to all second group courses except English 171–72.

Second Group*

170 *The American Short Story* (3) — Coberly
Fall—day. The historical development of the short story in America.

171–72 *Studies in American Literature* (3–3) — Lyon
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Major factors in the national cultural tradition as shown by outstanding writers. Prerequisite: English 51–52 or 71–72.

173–74 *Major American Poets* (3–3) — Coberly
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening; summer 1962—English 174 (3). Advanced critical study of significant writers and movements. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

175–76 *American Drama* (3–3) — Cole
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—English 176 (3). Historical and critical study of significant plays and forms. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

177–78 *American Fiction* (3–3) — Coberly
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Historical and critical study of significant novels and short stories. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

179–80 *Proseminar: Readings for American Thought and Civilization Majors* (3–3) — The Staff
Academic year—day and evening. Conferences and group discussions.

Third Group

271–72 *Seminar in American Thought* (3–3) — Walker
Not offered 1962–63. Intensive consideration of specific periods and themes, primarily literary, in the history of American civilization. Prerequisite: English 171–72 or the equivalent.

277–78 *Studies in American Fiction* (3–3) — Coberly
First half: fall—evening. *Second half:* not offered 1962–63. Prerequisite: English 177–78 or the equivalent. Open to the undergraduate with the approval of the instructor.

279–80 *Thesis* (3–3) — The Staff

Related Courses in Other Departments

Education 136, *Teaching English*
History 151–52, *English History*
Philosophy 111–12, *History of Philosophy*
Speech B, *American Speech for Foreign Students*
Speech 102, *Oral Interpretation of Literature*

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* All students enrolled in curricula leading to Bachelor's degrees in Columbian College who are required to take one year of English composition, and one year of literature in English, General Languages, French, German, Slavic Languages, or Spanish, will follow the sequence of English 1–2, 11–12, both semesters of one of the introductory literature courses, and English 4.

English 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second group courses except English 171–72

GEOGRAPHY*

Professor R. D. Campbell *(Chairman)*
Associate Professor H. W. Westermann†
Associate Professorial Lecturer J. P. Pickard
Assistant Professor J. T. Davis
Associate Joan Barry

First Group

51 *Introduction to Geography* (3) — The Staff
Fall—day; spring—evening; summer 1962. A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

52 *World Regions* (3) — The Staff
Fall—evening; spring—day; summer 1962. The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.

Second Group

103–4 *Cartography* (3–3) — The Staff
A year course: credit is not given for the first half until the second half is completed. Academic year—Saturday morning. Principles of cartographic drafting; elementary map projections; map and graph planning design and construction; uses and interpretation of maps. Prerequisite: Geography 51 and 52. Laboratory fee, $11 a semester.

115–16 *Physical Geography* (3–3) — Davis
Academic year: lecture (2 hours), laboratory and field trip (2 hours)—day. Introduction to the earth sciences: form of the earth, grids and time, weather and climate, geomorphic processes and land-forms, soils, vegetation; weather forecasting, map reading.

124 *Land Capabilities* (3)
1963–64 and alternate years. Evaluation of land capabilities based on analysis of locational, physical, economic, and social land characteristics. Principles of site analysis and best use. Systems of measurement of area potential.

125 *Transportation Complexes* (3)
1963–64 and alternate years. A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.

126 *World Economies* (3) — Davis
1962–63 and alternate years: fall—day. Description and comparison of differing regional economies—pastoral, agricultural, industrial; patterns of world distribution.

127 *World Population and Settlement* (3) — Westermann
1962–63 and alternate years: spring—day. Population composition, structures, and distribution; characteristic world settlement patterns in terms of population organization. Assessment of factors contributing to population pressures, explosions and migrations, urban and rural settlement patterns and trends.

133 *Regional Industrial Structures* (3) — Westermann
1962–63 and alternate years: fall—day. The nature of the industrial complex, types and distribution of industry, principles of industrial and economic development planning.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On sabbatical leave fall semester 1961–62.

134 *Location of Industry* (3) Westermann
1962–63 and alternate years: spring—day. Structure and development of the major world industries, industrial location requirements, principles of industrial equilibrium.

137 *Industrial Planning for Underdeveloped Areas* (3)
Summer 1962. The appraisal of industrial development potentials in non-industrial areas; the preparation and implementation of industrial development plans; peculiar problems of industrial development in traditional societies; the role of industrial countries, with particular emphasis on United States responsibilities.

141–42 *Urban Settlement* (3–3)
1963–64 and alternate years. Location, functions, and forms of cities; urban-rural relationships; the urban hierarchy; urban problems and the history of their development; the city of the future.

145 *World Cultural Geography* (3) Campbell
Fall—day. A study of differences in national character structures; modal behavior patterns and personality traits typical of various cultures; difficulties these differences present in interpersonal relations and intercultural communications.

146 *World Political Geography* (3) Campbell
Spring—day. Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.

173–74 *City Planning: Theory and Practice* (3–3)
Academic year—evening. Theories of city functions and structures; evaluation of urban activities, value systems; analysis of contemporary urban problems; optimum designs for future cities; theory and techniques of planning; action techniques; implementation of plans.

181 *United States** (3)
Not offered 1962–63.

183 *Western Europe** (3) Westermann
1962–63 and alternate years: fall—day.

184 *The Mediterranean** (3) Westermann
1962–63 and alternate years: spring—day.

185 *Africa** (3)
Offered 1963–64.

186 *The Middle East** (3)
Offered 1963–64.

191 *Latin America** (3)
1963–64 and alternate years. Davis

194 *Communist China** (3)
Spring—day.

195 *Eastern and Southeastern Asia** (3)
Not offered 1962–63.

196 *The Soviet Union** (3) Westermann
Fall—day.

197 *The Pacific** (3)
Not offered 1962–63.

198 *Australia** (3)
Not offered 1962–63.

* Regional survey. No prerequisites. For students particularly interested in the study of specific regions, regional courses in the departments of Economics, History, and Political Science are strongly recommended, for example: Economics 185–86, *Economic History and Problems of Latin America*; History 164, *South America since Independence;* and Political Science 177, *Recent Trends in Latin American Politics and Government.*

THIRD GROUP*

201–2 *Seminar: History and Philosophy of Geography* (3–3) Campbell, Westermann

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening. A study of the development of geographic thought, from Herodotus to the present; a critical appraisal of the great works of the world's most famous geographers; an attempt to develop a useful, contemporary philosophy of geography.

205–6 *Area Data Collection and Analysis* (3–3)

A year course: credit is not given for the first half until the second half is completed. Lecture (1 hour), laboratory and field (3 hours). 1963–64 and alternate years. Sources of regional information; methods and systems of data collection; quantitative and qualitative methods of analysis; systems of syntnesis.

211–12 *Reading Course in Economic Geography* (3–3)

Not offered 1962–63. The development of economic geography as a systematic approach to regional analysis, the literature of economic geography, research methods.

233–34 *Seminar: Regional and Urban Planning* (3–3) Westermann, Campbell

A year course: credit is not given for the first half until the second half is completed. Academic year—evening. Analysis of the planning function, major problems confronting the planner, contemporary status of planning—its areas of success and failure.

241–42 *Seminar: Place and Culture* (3–3)

1963–64 and alternate years. A study of the culture traits which characterize various ethnic groups and differentiate people-place associations.

251–52 *Seminar: World Problem Areas* (3–3)

Summer 1962—Geography 251 (3). A study of those parts of the world which have become matters of international concern, whether because of their political or social instability, unsound economic development, or aggressive tendencies. An evaluation of the complex of factors which have created the "problems".

295–96 *Research* (3–3) The Staff

Academic year—as arranged.

299–300 *Thesis* (3–3) The Staff

GEOLOGY†

Professor Geza Teleki *(Chairman)*
Professorial Lecturers **G. L. Christ, Michael Fleischer, H. T. Evans, Jr., I. G. Sohn**
Associate Professor **G. V. Carroll**
Associate Professorial Lecturer **Nicholas Hotton**
Lecturer **Irving Friedman**

FIRST GROUP

1–2 *Introductory Geology* (3–3) The Staff

Academic year: lecture (2 hours), laboratory and field trip (2 hours)—day. A survey course covering the principles of geology. *First half:* physical geology—materials of the earth's crust, geologic processes. *Second half:* historical geology—geological periods, evolution of life on earth. Laboratory fee, $6 a semester.

* Senior major or graduate status is required in all third-group courses.
† The Staff of Instruction here listed is for the academic year 1961–62.

12 *Minerals and Rocks* (3) Carroll

Spring: lecture (2 hours), laboratory (3 hours)—day. Introduction to the common minerals and rocks and their environments; identification of minerals by determination of their physical properties and by the use of elementary chemical tests. Prerequisite: Geology 1. Laboratory fee, $8.

SECOND GROUP

101 *History of Geological Sciences* (2) Teleki

Not offered 1962–63. Lectures on the development of geological thought and the history of geological and related sciences.

107 *Dynamic Geology* (3) Teleki

Fall: lecture (3 hours), recitation (1 hour)—day. The interrelation of endogene and exogene forces in the processes of sedimentation and vulcanism; geochemical and geophysical aspects of epicontinental and geosynclinal areas. Prerequisite: Geology 1-2, 12; Physics 11, 12.

111–12 *Mineralogy* (3–3) Carroll

A year course: credit is not given for the first half until the second half has been completed (except for chemistry majors who may receive credit for the first half only). Academic year: lecture (2 hours), laboratory (3 hours)—evening. *First half:* morphological crystallography and elementary aspects of optical crystallography with their application to the identification of minerals. *Second half:* optical mineralogy; identification of nonopaque minerals by use of the polarizing microscope. Prerequisite: Geology 1 and 12; Physics 11, 12, or permission of the instructor. Laboratory fee, $10 a semester.

115 *Petrography* (4) Carroll

Fall: lecture (2 hours), laboratory (4 hours)—evening. Megascopic and microscopic identification and classification of common rocks. Prerequisite: Geology 111-12. Laboratory fee, $10.

117 *Introduction to Petrology* (3) Carroll

1963–64 and alternate years: lecture (2 hours), laboratory (3 hours). Lectures on petrogenic theory; laboratory work on the diagnosis of rock genesis by polarizing microscopic determination of mineralogical and textural characteristics. Prerequisite: Geology 115. Laboratory fee, $10.

122 *Structural Geology* (3) Carroll

Spring: lecture (2 hours), laboratory and field trips as arranged—day. Genetic interpretation of geologic formations on the basis of their structures, with emphasis on applications to geological field work. Prerequisite: Geology 1-2; Physics 11, 12.

123 *Advanced Structural Geology* (3) The Staff

1963–64 and alternate years: lecture (1 hour), laboratory (4 hours). Introduction to specialized techniques of structural analysis, and to tectonic theory. Prerequisite: Geology 122. Recommended: Mechanical Engineering 10.

128 *Geomorphology* (3) Teleki

Lecture (2 hours), laboratory and field trips as arranged. 1962–63 and alternate years: spring—day. Nature and evolution of earth forms, interpretation of maps and aerial photographs. Prerequisite: Geology 107 or Geography 115–16.

142 *Economic Geology* (3) Teleki

1963–64 and alternate years: lecture (2 hours), laboratory and field trips as arranged. Genesis, distribution, mode of occurrence, and utilization of mineral raw materials. Mining industry in relation to economic life. Prerequisite: Geology 1, 12, 107. Laboratory fee, $10.

151–52 *Invertebrate Paleontology* (3–3) Teleki

Academic year: lecture (2 hours), laboratory (3 hours), field trips as arranged—day. Taxonomy of fossil invertebrates, development of phyla, paleoecology of invertebrate organisms. Prerequisite: Geology 1-2, 12. Laboratory fee, $8 a semester.

154 *Vertebrate Paleontology* (3) Hotton
Lecture (2 hours), laboratory or field as arranged. 1962–63 and alternate years: spring—evening. General features of vertebrate morphology and evolution as illustrated by the fossil record; problems of paleoecology and adaptation, where appropriate.

157 *Methods in Paleontology* (3) Sohn
1963–64 and alternate years. An introduction to the principles and techniques of paleontological research, including the rules of zoological nomenclature. Prerequisite: Geology 151–52.

166 *Stratigraphy* (4) Teleki
1963–64 and alternate years. Sedimentation, facies, evaluation of stratigraphic boundaries, principles of correlation, applied stratigraphic geology. *Prerequisite:* Geology 107, 115, 122.

173 *Regional Geology* (3) Carroll and Staff
1962–63 and alternate years: fall—day. Lecture and map work on the regional distribution of geological formations and structures. This course may be reelected for credit. Prerequisite: Geology 107, 122; Geography 51, or permission of the instructor.

THIRD GROUP

205–6 *Seminar* (3–3) The Staff
Academic year—as arranged. Special topics. Does not repeat itself and may be elected in successive years.

211 *X-ray Crystallography* (3) Christ
1962–63 and alternate years: fall—evening. The structure of crystals as determined by the X-ray method.

212 *Crystal Chemistry** (3) Evans
1962–63 and alternate years: spring—evening. Chemistry of the solid state. Bonding and coordination and the role of crystalline structure in chemistry and mineralogy.

241 *Geochemistry** (3) Fleischer
1963–64 and alternate years. Principles and theories on the abundance, relationships, and the distribution in the various rock and mineral species.

244 *Isotope Geology** (3) Friedman
1963–64 and alternate years. Investigation of geological phenomena by means of stable and unstable isotopes of elements and of changes in their abundance.

251–52 *Micropaleontology* (4–4) Sohn
Lecture (2 hours), laboratory as arranged. Not offered 1962–63. Identification with the binocular microscope of Ostracoda and other fossil micro-organisms. Micropaleontological techniques, paleontological research methods, taxonomy, and paleoecology. Age determination and correlation of stratigraphic units. Laboratory fee, $12 a semester.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged.

GERMANIC LANGUAGES AND LITERATURES†

Professors W. K. Legner *(Chairman)*, Gretchen Rogers
Associate Professor J. C. King
Assistant Professor H. D. Osterle
Associate Anne Cordero

* Prerequisite, an adequate background in physics and chemistry, to be determined in conference with the staff of instruction.

† The staff of instruction here listed is for the academic year 1961–62

First Group

1–2 *First-year German* (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. The essentials of German grammar; translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

3–4 *Second-year German* (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Selections from modern German prose; continuation and review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: German 1-2 or two years of high school German.

9–10 *German Conversation and Composition* (3–3) Osterle
Academic year—day. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

47 *Beginning German for Reading Examination Candidates* (0) The Staff
Fall—evening; spring—evening; summer 1962. Specifically for graduate students with little or no German, who are preparing for reading examinations. No academic credit. Tuition fee, $90.

49 *German Readings for Nonmajor Students* (3) The Staff
Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or 4F or the equivalent.

51–52 *Introduction to German Literature* (3–3) Osterle
Academic year—evening. Prerequisite: German 4 or the equivalent.

Second Group

103–4 *Goethe's "Faust"—Parts I and II* (3–3) Legner
1962-63 and alternate years: academic year—evening.

131–32 *German Literature of the Eighteenth Century* (3–3) Rogers
1963–64 and alternate years. The age of Lessing, Goethe, and Schiller.

141–42 *German Literature of the Nineteenth Century* (3–3) King
1963–64 and alternate years. Romanticism, Biedermeier period, Young Germany, Realism.

151–52 *German Literature of the Twentieth Century* (3–3) Rogers
1962-63 and alternate years: academic year—evening.

179–80 *Advanced Composition for Undergraduate and Graduate Majors* (1–1) King, Legner
Academic year—as arranged.

Third Group

201–2 *Middle High German* (3–3) Legner
1963–64 and alternate years.

205–6 *Gothic* (3–3) Legner
1962-63 and alternate years: academic year—day. Introduction to the comparative study of Germanic languages.

209–10 *Old High German* (3–3) King
1962-63 and alternate years: academic year—day.

213–14 *Old Norse* (3–3)
1963–64 and alternate years. Allee

219 *Teaching German in College* (3) The Staff
Fall—as arranged. Methodology, observation, and apprenticeship in college classes and the language workshop.

221–22 *General Linguistics; Comparative and Historical Indo-European Linguistics* (3–3) King
1963–64 and alternate years. *First half:* introduction to linguistics as a science. *Second half:* introduction to comparative and historical linguistics, with special reference to the Indo-European family.

223–24 *Linguistic Analysis of Modern German* (3–3)
1963–64 and every third year. Treatment of phonetics, phonemics, morphology, and syntax.

225–26 *Seminar: Linguistics* (3–3) King, Allee
1962–63 and every third year: academic year—day. Bibliography, methodology, readings, and research problems.

229 *German Literature of the Fifteenth and Sixteenth Centuries* (3) Legner
1963–64 and alternate years. Transition from chivalric to bourgeois literature. The eras of Humanism and the Reformation as reflected in the principal literary works.

230 *German Literature of the Seventeenth Century* (3) Legner
1963–64 and alternate years. Imitation of foreign models. The literary societies. Preciosity. The beginnings of realism in the novel. Pietism.

231–32 *German Classicism* (3–3) Rogers
1962–63 and alternate years: academic year—day. An advanced study and critique of the literature of the Goethezeit. Prerequisite: German 131–32 or the equivalent.

241–42 *Seminar: German Romanticism* (3–3) King
1962–63 and alternate years: academic year—evening. Treatment of individual writers, groups, motifs, and tendencies.

251–52 *Seminar: Studies in Twentieth Century German Literature* (3–3) Rogers
1963–64 and alternate years. Special projects in fiction, drama, poetry, and criticism.

261–62 *German-English and German-American Literary Relations and Interactions* (3–3) Osterle
Not offered 1962–63. Comparative study of major genres. Appraisal of influences.

271–72 *Seminar: German Literature* (3–3) Osterle
1962–63 and alternate years: academic year—day. Bibliography, methodology, readings, and research problems.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged. Required of all candidates for the Master's degree in German.

HISTORY*

Professors E. L. Kayser, Wood Gray, H. M. Merriman, R. H. Davison *(Chairman)*
Associate Professors W. C. Davis, R. B. Thompson, R. C. Haskett
Assistant Professor C. J. Herber
Instructor P. P. Hill

* The Staff of Instruction here listed is for the academic year 1961–62

First Group

39–40 *The Development of European Civilization* (3–3) Kayser, Herber
Academic year—day and evening; summer 1962. Primarily for freshmen. *First half:* the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half:* from 1715 to the present.

71–72 *The Development of the Civilization of the United States* (3–3) Haskett, Hill
Academic year—day and evening; summer 1962. Primarily for sophomores. *First half:* the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half:* from 1865 to the present.

Second Group*

109–10 *Ancient History* (3–3) Kayser
Academic year—day. The political, social, and intellectual aspects will be considered. *First half:* the ancient Near East and Greece. *Second half:* Rome.

111–12 *Medieval History* (3–3) Kayser
Not offered 1962–63. The political, social, and intellectual aspects will be considered. *First half:* from the 4th to the 12th century. *Second half:* from the 13th through the 16th century.

130 *Nationalism* (3) Kayser
Summer 1962. The historical evolution of modern nationalism.

131–32 *History of Germany* (3–3) Herber
Academic year—day. The political, social, and cultural development of the German people. *First half:* from the Reformation to 1871. *Second half:* from 1871 to the present.

141–42 *History of France* (3–3) Herber
Not offered 1962–63. A survey of the political, social, and cultural history of France. *First half:* from earliest times to 1815. *Second half:* from 1815 to the present.

143 *History of Old Russia* (3) Thompson
Not offered 1962–63. The Slavic and Eurasian roots of Russian society and politics over a thousand-year period, 800–1800.

145–46 *History of Modern Russia* (3–3) Thompson
Academic year—day. The rise and fall of the revolutionary cycle. *First half:* Tsarist Russia in the Golden Age, 1800–1917. *Second half:* Soviet Russia and the politics of empire, since 1917.

147 *Economic History of Europe* (3) Gray
Not offered 1962–63. A survey from ancient times to the present day.

148 *Oversea Expansion of Europe* (3)
Not offered 1962–63. International rivalries and the impact of European civilization in Africa and the Pacific basin since 1500, with emphasis on the 19th and 20th centuries.

149–50 *European Diplomatic History* (3–3) Davison
First half: 1963–64 and alternate years. *Second half:* spring—day and evening; summer 1962. Background of the European state system and of diplomatic practices and relations since the Congress of Vienna, with emphasis on the policies and actions of the great powers and their statesmen. *First half:* to 1878. *Second half:* since 1878.

151–52 *English History* (3–3) Kenny†
Academic year—day. A general survey of the development of political, social, and economic institutions of lasting significance in the English speaking world. *First half:* to 1689. *Second half:* since 1689.

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* History 39–40 is prerequisite to courses 109 through 152 and 190 through 196; History 71–72, to courses 170 through 184; either History 39–40 or 71–72, to courses 161 through 166.
† Appointment effective September 1962.

161 *Ancient Americans* (3) Davis
1962–63 and alternate years: fall—day. A study of the Maya, Aztec, Inca, and other early civilizations of North and South America.

162 *Iberian Background of Latin America* (3) Davis
Alternate spring and summer terms: spring—day; summer 1962. History of Spain and Portugal, with emphasis on developments leading to the rise and decline of the Spanish and Portuguese empires.

163 *Colonial Latin America* (3) Davis
Fall—evening. Political, economic, social, and institutional developments in Spanish and Portuguese America from the conquest through the wars of independence.

164 *South America since Independence* (3) Davis
Alternate spring and and summer terms: spring—evening; summer 1962. Development of the independent South American states in the 19th and 20th centuries.

166 *Mexico and the Caribbean since Independence* (3) Davis
Alternate spring and summer terms: summer 1963; spring 1964. A survey of the republics of Mexico, Central America, and the Caribbean islands.

170 *American Colonial History* (3) Haskett
Spring—evening. The settlement of the British colonies, the development of provincial institutions, and the emergence of an American civilization in the 17th and 18th centuries.

171–72 *Social History of the United States* (3–3) Gray
Academic year—evening; summer 1962—History 172 (3). Daily life, institutions, intellectual and artistic achievements of the Agrarian Era, 1607–1861; and the Urban-Industrial Era, 1861 to the present time.

173 *Representative Americans* (3) Gray
Spring—day; summer 1962. A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform.

174 *Economic History of the United States* (3) Gray
Fall—day. Main trends in the development of American agriculture, industry, and trade since 1607, with their Old World backgrounds and in their world setting.

175–76 *Political and Constitutional History of the United States* (3–3) Haskett
Academic year—day; summer 1962—History 175 (3). *First half:* to the eve of the Civil War. *Second half:* the Civil War to 1940.

177 *The South* (3) Gray
Not offered 1962–63. Rise of the plantation system and slavery; the intersectional conflict; and the problems and progress of the New South.

178 *The West* (3)
Not offered 1962–63. The role of the frontier in American history.

181–82 *Diplomatic History of the United States* (3–3) Merriman, Hill
Academic year—day and evening; summer 1962—History 181 (3). Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. *First half:* to 1898. *Second half:* since 1898.

183 *Oversea Expansion of the United States* (3) Merriman
Spring—day. The political, economic, social, and cultural life of our outlying possessions.

184 *Canada and the United States* (3) Merriman
Fall—day. The historical background and main trends in the relationship of the two English-speaking peoples of North America.

190 *History of India* (3) Thompson
Not offered 1962–63. The civilization of India and her neighbors from the beginnings to independence.

191–92 *Current History* (1–1)
Academic year—day. Contemporary events in their world setting.

193 *History of the Near East* (3) Davison
1962–63 and alternate years: fall 1962—day. The Byzantine, Arab, Persian, and Islamic backgrounds of Near Eastern history; the rise and decline of the Ottoman Empire; the action of European powers in the area; and the Ottoman breakup into the Turkish Republic and other successor states.

195–96 *History of the Far East* (3–3) Thompson
First half: not offered 1962–63. *Second half:* spring—day. *First half:* the civilization of China and Japan from the beginnings to 1600. *Second half:* the modern Far East under the impact of the West since 1600.

197–98 *Proseminar in Latin American Civilization* (3–3) Davis, Robb, Sammons
Academic year—as arranged. Reading course for coordination and review. Open only to majors in Latin American Civilization.

199–200 *Proseminar: Readings for the History Major* (3–3) Thompson
Academic year—evening. Limited to majors in History. Readings and discussions on main trends in the history of Western civilization, including representative selections from the classics of historical literature.

THIRD GROUP*

211–12 *Reading Course in Medieval History* (3–3) Herber
Academic year—day. Primarily for graduate students.

241–42 *Seminar in Modern European History* (3–3) Davison
Academic year—evening.

243 *Reading Course in Modern European History* (3) Thompson
Fall—as arranged. Primarily for graduate students.

246 *Seminar in Eurasian History* (3) Thompson
Spring—evening.

247 *Reading Course in Russian History* (3) Davison
Fall—evening. Primarily for graduate students.

249 *Seminar in European Diplomatic History* (3) Kenny
Fall—day.

251–52 *Seminar in English History* (3–3) Davis
Academic year—afternoon.

261–62 *Seminar in Latin American History* (3–3) Gray
1963–64 and alternate years.

271–72 *Seminar in the Social History of the United States* (3–3) Gray
Academic year—evening.

273–74 *Reading Course in American Economic and Social History* (3–3) Haskett
Academic year—as arranged. Primarily for graduate students.

275–76 *Seminar in American Political and Constitutional History* (3–3)
Academic year—evening.

* Approval of the instructor is required for registration in each third-group course.

277–78 *Reading Course in American Political and Constitutional History* (3–3) Haskett
First half: 1962–63 and alternate years—fall as arranged. *Second half:* 1963–64 and alternate years—fall as arranged. Primarily for graduate students.

281–82 *Seminar in the Diplomatic History of the United States* (3–3) Merriman
Academic year—day.

285–86 *Reading Course in American Diplomatic History* (3–3) Merriman
Academic year—evening. Primarily for graduate students.

291–92 *Seminar* (3–3) The Staff
Academic year—as arranged; summer 1962—History 291 (3). Prerequisite: approval of the Department.

294 *Seminar in the History of the Modern Near East* (3) Davison
Spring—evening.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962. Required of all candidates for the Master's degree specializing in history.

HOME ECONOMICS*

Professor Kathryn Towne *(Chairman)*
Associate Professorial Lecturer Mary Osterndorf

First Group

1 *Food Selection and Preparation* (3)
Not offered 1962–63. Composition, selection, and preparation of food; analysis of recipes; standard products; planning, preparing, serving, and estimating the cost of meals. Material fee, $18.

22 *Clothing: Its Selection, Cost, and Care* (3) Towne
Not offered 1962–63. Clothing selections—the economic, aesthetic, and hygienic aspects; the application of the principles of color and design to individual selection; the care of clothing.

51 *Family Meals* (3) Osterndorf
Fall—day. The choice, purchase, preparation, and service of foods; dietary standards, food habits, and the nutritional needs of the family; problems of purchasing, care, and use of food by the consumer. Material fee, $11.

53 *Family Health and Household Sanitation* (3) Towne
Spring—day. Home hygiene and home care of the sick; the principles of household sanitation in relation to health and diseases.

62 *Clothing Construction* (3) Towne
Not offered 1962–63. Simplified techniques and unit method of construction suitable for cotton, wool, silk, and man-made fibers; the use of commercial patterns and their alteration; the proper selection of color, design, and fabric. Material fee, $8.

66 *Fabric Decoration* (3) Towne
Lecture (1 hour), laboratory (4 hours). Not offered 1962–63. Original pattern and color combinations; application to a variety of hand methods of decorating fabrics for use as clothing, draperies, and upholstering; use of stencils, block and screen printing, and other simple equipment.

* The Staff of Instruction here listed is for the academic year 1961–62.

71 *Costume Design and Fashion Economics* (3) Towne
Not offered 1962–63. Factors determining fashions and effect on cost of clothing, problems of the consumer of textiles and clothing, historic costume and its relation to modern dress. Material fee, $8.

72 *Household Textiles* (3) Towne
Not offered 1962–63. Properties, uses, and tests of the different textile fibers and fabrics, and development of judgment and knowledge of standard for the consumer of clothing and house-furnishing material. Material fee, $8.

77 *Marketing* (3)
Not offered 1962–63. Purchasing of foods as it relates to the home and to the institution.

SECOND GROUP

102 *Advanced Food Preparation* (3) Osterndorf
Spring—day. The application of the fundamental processes of food preparation to a wider range of food materials and various services for different occasions. Material fee, $18.

106 *Quantity Cookery* (3)
Not offered 1962–63.

123 *Household Finance and Problems of the Consumer* (3) Towne
Not offered 1962–63. Economic problems of the family in modern industrial society, family income, income apportionment and household expenditures, laws affecting the home, investments, consumer buying.

143 *Advanced Clothing Construction* (3) Towne
Not offered 1962–63. Problems of clothing construction and flat pattern designing. Material fee, $8.

148 *Food Problems and Demonstration Methods* (3)
Not offered 1962–63. Factors affecting the preparation of standard products from the experimental viewpoint, principles of demonstration. Material fee, $18.

152 *Nutrition* (3)
Not offered 1962–63. Lecture course on the principles of normal and abnormal human nutrition. Laboratory work on the calculation and preparation of dietaries. Laboratory fee, $8.

154 *Diet Therapy* (3)
Not offered 1962–63. Study of nutrition as applied to diet and disease. Material fee, $8.

164 *Child Nutrition* (3) Osterndorf
Fall—day. Basic principles and practices in nutrition at infant, pre-school, and adolescent ages. Demonstration of nutritional and special food requirements.

168 *Institutional Management* (3)
Not offered 1962–63. Study of the organization, equipment, and marketing problems of institutions.

171 *House Furnishing* (3) Towne
Fall—day. Home planning from the historic, artistic, economic, and sanitary viewpoints; home furnishings such as linens, dishes, floor covering, mattresses, etc. Material fee, $5.

172 *Problems in Home Furnishings* (3) Towne
Lecture (1 hour), laboratory (4 hours). Not offered 1962–63. Workshop-type course in home furnishings, including upholstering, slip covering, refinishing furniture, and making draperies.

181 *The Child in the Home* (3)
Not offered 1962–63. Care and development of children, parent-child relationships.

192 *The Home, Its Management and Equipment* (3) Towne
Fall—day. Economic management of the home; distribution of time and energy; problems in the selection, arrangement, and care of equipment.

193 *Supervision of Home Management* (3) The Staff
As arranged. Field work under supervision. Designed to meet requirements of those preparing to teach in federally aided schools.

195 *Special Problems* (3) The Staff
Spring—day. Individual investigation or study under the guidance of a member of the Staff. Topic for 1962–63: tailoring.

197–98 *Proseminar* (3–3) The Staff
Academic year—evening. The study of the most recent materials and problems in the various phases of home economics.

JOURNALISM*

Professor R. P. Schlabach, Jr. *(Chairman)*
Associate Professor R. C. Willson
Lecturers F. L. Dennis, J. V. Hinkel, Louis Robinson, T. R. Smith

First Group

71–72 *Journalism in American Society* (3–3) Willson
Academic year—day and evening. Evolution of newspapers and other media in relation to political, social, and economic life; the concept of press freedom; problems of contemporary journalism.

Second Group

111 *Reporting* (3) Schlabach
Fall—day; spring—evening; summer 1962. Instruction and classroom practice in gathering, evaluating, and writing news; emphasis on newspapers, other media considered.

115 *Editing and Make-up* (3) Schlabach
Fall—evening; summer 1962. Editing of news and other material for publication, typography and display; use of pictures and other graphic presentations.

121 *Advanced Reporting: Magazine Feature Articles* (3) Willson
Spring—day; summer 1962. Instruction and practice in writing magazine articles, material for which is obtained through independent investigation.

133 *Advanced Reporting: Community News* (3) Schlabach
Fall—day. Instruction and practice in coverage and writing of local news.

137 *Advanced Reporting: National Affairs* (3)
Not offered 1962–63. Instruction and practice in coverage and writing of federal government news from the point of view of the press association.

140 *Pictorial Journalism* (3) Smith
Spring—evening. Photographic techniques affecting publication, the illustration and the story angle, standards of judgment in selection and use of pictures, captions, editing technique, cropping for effective reproduction.

142 *Retail Newspaper Advertising* (3) Robinson
Spring—evening. Retail newspaper advertising management, coordination of newspaper advertising with retail sales patterns, advertising readership, copy preparation, production methods.

* The Staff of Instruction here listed is for the academic year 1961–62.

143 *Industrial Communications* (3) Willson
Fall—evening. An introduction to the field of corporate journalism. Writing and editing the employee magazine. Preparation of annual reports. Editing stockholder publications, and external house organs.

144 *Advanced Reporting: the Arts and Sciences* (3) Willson
Not offered 1962–63. Instruction and practice in writing articles for publication in such fields as the arts, business and economics, science, and technology.

145 *Principles and Problems of Public Relations* (3) Hinkel
Fall—Saturday morning. Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs.

151 *Editorial Writing* (3) Schlabach
Spring—day. Instruction and practice in writing of editorials on public affairs.

196 *Seminar* (3) Schlabach
Spring—as arranged. For Journalism majors only. Research in areas relating journalism to secondary fields of study.

198 *Law of the Press* (3) Dennis
Fall—Saturday morning. Freedom of the press, censorship, legislative controls, publications as contempt of court, copyright, news gathering agencies, labor law and the newspaper business, law of libel, privileged matter, fair comment on public characters, right of privacy.

MATHEMATICS*

Professors F. E. Johnston, Florence Mears, N. D. Nelson *(Chairman)*, T. P. G. Liverman, N. A. Wiegmann
Professorial Lecturers W. H. Marlow, D. M. Dribin, Thomas Saaty
Associate Professorial Lecturers Joseph Blum, P. A. Devore, J. P. Fennell
Assistant Professors W. A. Smith, R. Z. Vause, Hewitt Kenyon
Lecturers Mabel Morris, A. J. Ziffer, Howard Banilower, Jerome Deutschberger, R. F. Snyder, R. A. Welker

First Group†

3 *College Algebra* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 *Plane Trigonometry* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

9 *General Mathematics I* (3) The Staff
Fall—day; spring—evening; summer 1962 (offered as Mathematics 2). For those students in the School of Education or others electing Mathematics 9 and 10 as a terminal sequence in mathematics. Propositional logic and truth values; the num-

* The Staff of Instruction here listed is for the academic year 1961–62.

† No first-group course in mathematics is available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.

ber system, number bases, arithmetical computation; algebraic functions; topics from plane geometry. Prerequisite: two years of high school mathematics. Not open to students who have had former Mathematics 2.

10 *General Mathematics II* (3) The Staff

Spring—day. An introduction to matrices and vector spaces; non-Euclidean geometry; introduction to concepts of the calculus. Prerequisite: Mathematics 9 or former 2.

12 *Analytic Geometry* (3) The Staff

(This course will be offered for the last time summer 1962.)

Summer 1962. Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

21 *Calculus I* (3) The Staff

Fall—day and evening; spring—day and evening. Elementary concepts of analytic geometry. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite: Mathematics 3 and 6; or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or the equivalent.

22 *Calculus II* (3) The Staff

Spring—day and evening. Differentiation and integration of transcendental functions and applications; conics; parametric equations; techniques of integration. Prerequisite: Mathematics 21.

23 *Calculus III* (3) The Staff

Spring—evening. Vector concepts; improper integrals; solid geometry; partial differentiation and applications. Prerequisite: Mathematics 22.

24 *Calculus IV* (3) The Staff

Offered 1963–64. Multiple integration with application; infinite series; differential equations. Prerequisite: Mathematics 23.

27 *Calculus I and II* (6) The Staff

The equivalent of Mathematics 21 and 22.

Fall—day and evening; spring—day.

28 *Calculus III and IV* (6) The Staff

The equivalent of Mathematics 23 and 24.

Spring—day.

29 *Calculus I* (3) The Staff

(This course is being offered for the last time summer 1962.)

Summer 1962. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

30 *Calculus II* (3) The Staff

(This course is being offered for the last time fall semester 1962–63.)

Fall—day and evening; summer 1962. Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.

31 *Calculus III* (3) The Staff

(This course is being offered for the last time spring semester 1962–63.)

Fall—day and evening; spring—day and evening; summer 1962. Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor).

Second Group*

101 *Introduction to Mathematical Logic* (3) Nelson

Fall—evening. Development of propositional and predicate calculi, basic semantic

* Mathematics 31 or 24 is prerequisite to all second-group courses.

concepts, elementary intuitive set theory, Boolean algebra. Prerequisite: Mathematics 31 or 24 or Philosophy 121.

102 *Fundamental Concepts of Mathematics* (3) — Nelson
Spring—evening. Axiomatic set theory, cardinal and ordinal arithmetic, foundations of the real number system. Prerequisite: Mathematics 101 or permission of the instructor.

106 *Topology for Undergraduates* (3) — Kenyon
1963–64 and alternate years.

111 *Mathematics for Engineers and Physicists I* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 31 or 24.

112 *Mathematics for Engineers and Physicists II* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.

120 *Introduction to Theory of Numbers* (3) — Vause
1963–64 and alternate years.

122 *Introduction to Abstract Algebra* (3) — The Staff
Fall—evening.

123 *Theory of Equations* (3)
Not offered 1962–63.

124 *Introduction to Matrix Theory* (3) — The Staff
Fall—day; spring—evening; summer 1962. Elementary theory of finite vector spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices.

125 *Advanced Algebra* (3)
Not offered 1962–63.

126 *Advanced Analytic Geometry* (3)
Not offered 1962–63.

132 *Differential Equations* (3)
Not offered 1962–63.

134 *Introduction to Boundary Value Problems* (3) — The Staff
Spring—evening. Prerequisite: Mathematics 111, 132, or 142.

135 *Projective Geometry* (3) — The Staff
Fall—evening.

139 *Advanced Calculus I* (3) — The Staff
Fall—evening; spring—day; summer 1962. Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.

140 *Advanced Calculus II* (3) — Mears
Spring—evening. Vector fields, multiple integrals, line and surface integrals, point set theory, theory of integration, improper integrals. Prerequisite: Mathematics 139.

141 *Introduction to Infinite Series* (3) — Mears
Fall—evening.

142 *Theory of Differential Equations* (3)
Fall—evening. Prerequisite: Mathematics 139.

167 *Fourier Series and Spherical Harmonics* (3)
Not offered 1962–63. Prerequisite: Mathematics 111 or 132.

171 *Vector Analysis* (3) — The Staff
Fall—day; spring—evening.

THIRD GROUP

201–2 *Mathematical Logic* (3–3) — Nelson
1963–64 and alternate years.

220 *Theory of Numbers* (3) — Vause
1963–64 and alternate years.

237–38 *Theory of Functions of a Complex Variable* (3–3) — Johnston
A year course: credit is not given for the first half until the second half is completed.
1963–64 and alternate years.

242 *Infinite Series* (3) — Mears
Spring—evening.

243–44 *Numerical Analysis* (3–3) — Marlow
1963–64 and alternate years. Prerequisite: Mathematics 111, 132, or 142.

249 *Ordinary Differential Equations* (3)
Fall—evening.

250 *Integral Equations* (3)
Not offered 1962–63.

251–52 *Theory of Functions of a Real Variable* (3–3) — Liverman
A year course: credit is not given for the first half until the second half is completed.
Academic year—evening.

255 *Differential Geometry* (3)
Not offered 1962–63.

257 *Theory of Groups* (3) — Johnston
Fall—evening.

261 *Generalized Functions and Operational Methods* (3) — Liverman
1963–64 and alternate years. Theory of generalized functions in one variable. Operational calculus of generalized functions. Applications to differential equations and Fourier analysis. Prerequisite: Mathematics 140.

262 *Advanced Operational Methods* (3) — Liverman
1963–64 and alternate years. Generalized functions on test spaces of analytic functions. Operational calculus in several variables. Applications to partial differential and convolution equations of applied mathematics. Prerequisite: Mathematics 261.

265–66 *Modern Algebra* (3–3) — Wiegmann
Academic year—evening. Fundamental concepts of theory of groups, rings, and fields. Theory of finite fields, extension fields, Galois groups, factorization theory in Gaussian domains, and groups with operators.

267 *Topics in Matrix Theory* (3) — Wiegmann
Not offered 1962–63. Theory of linear transformations (vector spaces over a division ring), advanced classical theory, matrix representation of groups and rings, special topics as time allows. Prerequisite: Mathematics 124 and an elementary knowledge of groups, rings, and fields.

268 *Calculus of Variations* (3)
Not offered 1962–63.

270 *Tensor Analysis* (3)
Not offered 1962–63.

272 *Hilbert Space* (3)
Spring—evening.

277 *Partial Differential Equations* (3)
Spring—evening.

281–82 *Introduction to Topology* (3–3) Kenyon
Academic year—evening.

295–96 *Reading and Research* (3–3) The Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

MICROBIOLOGY*

Professors R. G. Beachley *(Emeritus)*, A. M. Griffin, Mary Robbins *(Acting Chairman)*, R. C. Parlett
Clinical Professor Murray Grant
Associate Professor Rudolph Hugh
Assistant Professor R. C. Wood
Clinical Instructor A. H. Traum
Associates W. D. Hann, G. B. Pelleu, Jr.

Special Lecturers L. S. Baron, R. C. Cook, C. W. Emmons, F. B. Gordon, Leon Jacobs, M. C. Leikind, J. D. MacLennan, H. J. Magnuson, W. J. Peeples, G. O. Pierce

112 *General Microbiology* (4) Hugh
Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M. For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications. Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11–12. Laboratory fee, $13.

209 *Medical Microbiology* (1 to 11) The Staff
Fall: lecture (4 hours), laboratory (10 hours)—as arranged. Bacteria, rickettsiae, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsiae and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, $4.50 for each semester hour of laboratory work.

210 *Fundamentals of Epidemiology and Preventive Medicine* (2) Grant
Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Microbiology 112 or 209.

219–20 *Advanced Microbiology* (arr.) Hugh and Staff
Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Microbiology 112 or 209; Chemistry 151–52 or the equivalent; permission of the instructor. Laboratory fee, $4.50 a semester hour.

* The Staff of Instruction here listed is for the academic year 1961–62.

225 *Bacterial Chemistry and Physiology* (2) **Wood**
1963–64 and alternate years: fall—as arranged. A lecture course in those areas of biochemistry peculiar to Class Schizomycetes, including discussion of the use of bacteria in the elucidation of biochemical problems. Prerequisite: Biochemistry 221–22 or the equivalent. A course in microbiology is recommended but is not essential.

232 *Immunological Methods* (3) **The Staff**
1962–63 and alternate years: spring—as arranged. Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $11.

234 *Virology* (6) **Robbins**
1963–64 and alternate years: spring—as arranged. Study of viruses and rickettsiae. Lectures and laboratory exercises. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $16.

240 *Advanced Epidemiology* (3) **The Staff**
Spring—as arranged. Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Microbiology 210. Prerequisite: Microbiology 210.

249–50 *Introduction to Medical Research** (3–3) **The Staff**
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

293–94 *Staff Seminar* (1–1) **The Staff**
Academic year as arranged. For graduate students. Bi-weekly throughout the year.

295–96 *Research in Microbiology* (arr.) **The Staff**
Academic year—as arranged.

299–300 *Thesis* (3–3) **The Staff**

PATHOLOGY†

Professors T. M. Peery *(Chairman)*, W. R. Duryee *(Research)*
Clinical Professor D. L. Weiss
Associate Professors F. N. Miller, Jr., William Newman, W. L. Marsh
Assistant Professors Lois Platt *(Cytology)*, Alexander Breslow, John Culberson

SPECIAL STAFF FOR DEMONSTRATIONS

Associate Clinical Professors J. S. Howe, E. F. Geever, R. G. Gottschalk
Assistant Clinical Professors R. E. Palmer, W. F. Enos, Cornelia Hoch-Ligeti
Associates L. E. Zimmerman, L. W. Fix, C. B. Cook
Clinical Instructors D. R. Parkinson, I. D. Godwin

Special Lecturers E. B. Helwig, L. C. Johnson

115–16 *Introduction to Medical Science* (1–1) **Marsh and Staff**
Academic year—1 hour a week. For students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.

* This is an interdepartmental course. The student should register in the department directing his research.
† The Staff of Instruction here listed is for the academic year 1961–62.

117–18 *Principles in Medical Technology* (4–4) Marsh and Staff
Academic year—4 hours a week. For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry, clinical bacteriology, serology, hematology, and clinical microscopy.

119–20 *Medical Technology Laboratory* (10–10) Marsh and Staff
30 hours a week for 50 weeks. Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.

281 *Problems in Experimental Cellular Pathology* (1) Duryee
Fall—1 hour a week as arranged. For nonmedical graduate students. Also for a limited number of specially qualified medical students on an elective basis. Cytological and biophysical aspects of cellular function in relation to normal and selected pathological conditions.

PHARMACOLOGY*

Professor H. G. Mandel *(Chairman)*
Clinical Professor R. G. Smith
Professorial Lecturer B. B. Brodie
Associate Professor Clarke Davison
Assistant Professors V. H. Cohn, Jr., T. M. Farber, Paul Mazel, Melvin Reich *(Research)*, J. F. Henderson *(Research)*, George Fiala *(Research)*, Elizabeth Tidball *(Research)*

249–50 *Introduction to Medical Research*† (3–3) The Staff
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

261 *Pharmacology* (5) The Staff
Fall—5 hours a week. Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students.

262 *Pharmacology* (1) The Staff
Spring—1 hour a week. Continuation of Pharmacology 261. Pharmacological uses of normal body constituents.

263 *Pharmacology Laboratory* (1) The Staff
Fall—3 hours a week. Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students.

267–68 *Pharmacological Research* (arr.) The Staff
Academic year—as arranged. Primarily for those properly qualified graduate and medical students seeking careers in pharmacology.

269–70 *Pharmacology Seminar* (1–1) The Staff
Academic year—2 hours a week. Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students.

279–80 *Mechanism of Drug Action* (1–1) The Staff
Academic year—as arranged. A course to familiarize the student with advances

* The Staff of Instruction here listed is for the academic year 1961–62.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

biochemical, microbiological, and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged. Required of Master of Arts and Master of Science candidates.

PHARMACY*

Professors C. W. Blivent, R. M. Leonard *(Acting Chairman)*
Associate Professors C. J. Kokoski, S. M. Schwartz, F. D. Cooper
Assistant Professor G. G. Koustenis

Special Lecturers W. S. Apple, G. F. Archambault, Karl Bambach, W. P. Briggs, C. J. Carr, E. G. Feldmann, D. L. Finucane, L. E. Kazin, Henry Miller, M. L. Yakowitz

Second Group

100 *Introductory Pharmacy* (1) The Staff
Fall: lecture and field trips—day. Introduction to pharmacy through the study of professional areas in which pharmacists are employed. Field trips include visits to representative retail and hospital pharmacies, wholesale drug houses, and museums.

101 *Inorganic Pharmaceutical Chemistry* (3) Schwartz
Fall: lecture (2 hours), laboratory (3 hours)—day. A study of the occurrence, methods of preparation, properties and uses of the important inorganic chemicals encountered in pharmacy and medicine. Prerequisite: Chemistry 21. Laboratory fee, $11.

102 *Dispensing Pharmacy* (4) Kokoski, Koustenis
Fall: lecture (2 hours), laboratory (6 hours)—day. Compounding of typical prescriptions and a study of incompatibilities. Prerequisite: Pharmacy 110, 111, 122. Laboratory fee, $18.

103 *Dispensing Pharmacy* (4) Kokoski, Koustenis
Spring: lecture (2 hours), laboratory (6 hours)—day. Continuation of Pharmacy 102. Laboratory fee, $18.

107 *Pharmacy Accounting* (3) Koustenis
Fall—day. The financial records required in the operation of a pharmacy.

109 *First Aid* (1)
Fall—day. Standard course in first aid methods and practice.

110 *Organic Pharmaceutical Chemistry* (3) Schwartz
Fall—day. A survey of important synthetic and naturally occurring medicinal agents in current use with emphasis on nomenclature, isolation or synthesis, properties, and structure-action relationship. Prerequisite: Chemistry 152.

111 *Organic Pharmaceutical Chemistry* (3) Schwartz
Spring—day. Continuation of Pharmacy 110. Prerequisite: Pharmacy 110.

112 *Physical Pharmacy* (4) Schwartz
Spring: lecture (3 hours), laboratory (3 hours)—day. Physicochemical principles and laws as they apply to pharmaceutical systems and preparations. Prerequisite: Pharmacy 101 and 110; concurrent registration: Pharmacy 111. Laboratory fee, $11.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence 1961–62.

113 *Organic Pharmaceutical Chemistry* (1) Schwartz
Laboratory (3 hours). Fall—day; spring—day. Preparation of selected official organic drugs. Prerequisite: Pharmacy 110. Prerequisite or concurrent registration: Pharmacy 111. Laboratory fee, $11.

115 *History of Pharmacy* (3) Bliven
Fall—day. Historical development of the profession, including the literature, from ancient times to the present.

121–22 *General Pharmacy* (4–4) Kokoski, Cooper, Schwartz
First half: fall—lecture (3 hours), laboratory (3 hours)—day. *Second half:* spring—lecture (2 hours), laboratory (6 hours)—day. Essential pharmaceutical processes; theory and manufacture of pharmacopeial and formulary galenical preparations; pharmaceutical usage of certain classes of substances and preparations. Laboratory fee: Pharmacy 121, $11; Pharmacy 122, $18.

125 *Pharmaceutical Calculations* (3) Kokoski
Fall—day. Systems of weights and measures and their application in the practice of pharmacy.

126 *Pharmacognosy* (3) Leonard
Fall: lecture (2 hours), laboratory (3 hours)—day. Practices and procedures for the production, preservation, protection, and evaluation of crude drugs; biosynthetic origin of drugs and pharmaceuticals, representative examples, and their value in pharmacy and medicine. Prerequisite: Biology 1–2*; Chemistry 151–52. Laboratory fee, $11.

127 *Pharmacognosy* (3) Leonard
Spring—day. Antibiotics, immunologic agents, allergens, hormones, vitamins, and pesticides. Prerequisite or concurrent registration: Microbiology 112; Physiology 137.

164 *Introduction to Pharmacology* (3) Leonard
(This course is being offered for the last time spring semester 1963.)
Spring—day. Limited to transfer students enrolled in the five-year program prior to the offering of Physiology 137, 160, and 170. Historical development, literature, and general principles of pharmacology; general anatomical, physiological, and pharmacological considerations of the autonomic, central, and somatic nervous systems; cardiovascular, gastrointestinal, and genitourinary systems; skin and mucous membranes. Prerequisite: Physiology 115; Biology 2†. Prerequisite or concurrent registration: Biochemistry 221–22.

165–66 *Pharmacology* (4–4) Leonard
First half: fall—lecture (4 hours), day. *Second half:* spring—lecture (3 hours), laboratory (4 hours), day. Drugs acting on the autonomic, central, and somatic nervous systems; cardiovascular, hematopoietic, genitourinary, endocrine, and digestive systems; histamine and antihistaminics; anti-infective agents; miscellaneous drugs; and their major clinical indications or therapeutic uses. Prerequisite: Biology 2†; Physiology 137 and 160 or 170; Microbiology 112; Biochemistry 221–22. Pharmacy 166: laboratory fee, $18.
For students in the four-year program who have completed Pharmacy 105 and 106 and those in the five-year program taking Pharmacy 164, Pharmacy 165 is a three-credit course. Pharmacy 166 is a three-credit course (lecture—2 hours, laboratory—4 hours). Biochemistry 221–22 is taken concurrently with Pharmacy 165–66.

167–68 *Pharmacology III* (3–3) Leonard
Not offered 1962–63. Laboratory work in pharmacological technique. Prerequisite or concurrent registration: Pharmacy 165. Laboratory fee, $18 a semester.

172 *Advanced Dispensing Pharmacy* (3) Kokoski
Spring—day. The study of special problems in dispensing pharmacy. Prerequisite: Pharmacy 103. Laboratory fee, $18.

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.
† Offered by the department of Zoology.

174 *Quantitative Pharmaceutical Analysis* (3) **Bliven, Schwartz**
Spring: lecture (1 hour), laboratory (6 hours)—day. Drug analysis. Prerequisite: Chemistry 22. Laboratory fee, $18.

176 *Pharmaceutical Law* (3) **Frailey**
Spring—day. Students in the four-year program receive 2 semester hours of credit.

178 *Pharmacy Management* (3) **Koustenis**
Spring—day. Policies and operations relating to the management of pharmacy. Students in the four-year program attend 4 hours of lecture and receive 4 semester hours of credit.

184 *Special Problems in Pharmacy* (arr.) **Kokoski, Schwartz**
Fall—as arranged; spring—as arranged. Directed laboratory and library research on special problems in pharmacy and pharmaceutical chemistry. For selected undergraduate students. Prerequisite: Pharmacy 102 and 110. Fees to be arranged.

188 *Survey* (1) **Leonard and Staff**
Spring—day. A symposium covering the various phases of pharmacy.

190 *Hospital Pharmacy* (1) **Cooper**
Spring—day. Organization and functions of hospitals; organization and operation of a hospital pharmacy; professional and sickroom supplies. Prerequisite: Pharmacy 102.

192 *Hospital Pharmacy: Prescription Practice* (1) **Cooper and Staff**
Fall—as arranged; spring—as arranged; summer 1962. Prescription practice in the University Hospital Pharmacy. Prerequisite: Pharmacy 102.

194 *Manufacturing Pharmacy* (3) **Cooper and Staff**
Lecture (1 hour), laboratory (6 hours). Fall—as arranged; spring—as arranged. The manufacture of bulk pharmaceuticals in the University Hospital Pharmacy. Elective for seniors.

PHILOSOPHY*

Professor C. E. Gauss *(Chairman)*
Associate Professor R. H. Schlagel
Lecturer C. H. Pfuntner

First Group

51–52 *Introduction to Philosophy* (3–3) **The Staff**
Academic year—day and evening; summer 1962—Philosophy 51 (3). A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.

Second Group

101 *Philosophic Problems in Living Issues* (1) **Gauss**
Not offered 1962–63. Selected public issues used as the basis for demonstrating the methods and relevance of philosophical analysis. This course may be reelected for credit once only.

111–12 *History of Philosophy* (3–3) **Pfuntner**
Academic year—evening. The history of western philosophy from early Greece to Kant, seen as the development and modification of the Hellenic cultural pattern.

* The Staff of Instruction here listed is for the academic year 1961–62.

113 *History of Nineteenth and Twentieth Century Philosophy* (3) Pfuntner
Fall—evening. European philosophy from the time of Kant. "Isms" and ideologies at the root of contemporary thought.

121–22 *Logic and Scientific Method* (3–3) Gauss
Academic year—day. *First half:* the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of symbolic logic, the nature of a formal system. *Second half:* general analysis of the methods of investigation and reasoning used in the natural and social sciences, procedures and requirements of definition, classification and sorting, analogical and inductive inference, causal determination, the nature and function of hypothesis, measurement, principles of the theory of probability.

131 *Ethics* (3) Schlagel
Fall—evening. A critical examination of traditional ethical theories from Plato to Ayer. Consideration of the theoretical problems of ethics: the meaning of "good", the nature of ethical judgment, the justification of ethical standards. The course aims at enabling the student to develop his own ethical view as a consequence of his greater understanding of moral phenomena.

142 *Philosophies Men Live by* (3) Schlagel
Spring—evening. Critique of the tenets, methodologies, and presuppositions of current, vital philosophical orientations: Existentialism, Positivism, Pragmatic Naturalism, Theism, Linguistic Analysis. A critique of reason and faith, and the nonrational aspects of man as guiding influences in life.

151 *The Philosophy of Science* (3) Schlagel
Fall—day. Brief history of modern science; problems of the meaning of causality, the justification of induction, theories of probability; the nature of scientific explanation and the status of inferred entities; the nature of a mathematical system. Consideration of the philosophic import of certain scientific theories such as Einstein's theory of relativity, Heisenberg's principle of indeterminacy, and Bohr's principle of complementarity.

152 *Epistemology* (3) Schlagel
Spring—day. The meaning and criteria of truth; the meaning and cognitive significance of common sense, scientific, and religious propositions or beliefs. Study of problems related to perception, verification, universals, *a priori* and *a posteriori* knowledge, the concept of mind.

162 *Aesthetics* (3) Gauss
Spring—day. The nature of aesthetic experience, problems of appreciation and judgment in the arts, and of the theories and process of artistic creation. Emphasis on contemporary arts and criticism.

172 *American Philosophy* (3) Pfuntner
Spring—evening; summer 1962. The philosophies of Peirce, Royce, James, Dewey, and Santayana as representative of American thought.

180 *Philosophy of History* (3) Gauss
Fall—day. Problems of historical knowledge and explanation. Critique of philosophies of history.

193 *Topics in Contemporary Philosophy* (3) Gauss
Summer 1962. Intensive study of one selected topic in contemporary philosophic literature.

199–200 *Proseminar: Readings for the Major* (3–3) Schlagel
Academic year—as arranged. Conferences and group discussions in preparation for field-of-study major examination.

THIRD GROUP

201–2 *Readings and Research* (3–3) The Staff
Academic year—as arranged. Advanced readings and reports. Investigation of special problems.

211 *Seminar in Plato* (3) Gauss
Spring—as arranged. Intensive study of Plato's later dialogues.

212 *Seminar in Aristotle* (3) Schlagel
Not offered 1962–63. Aristotle's logic, metaphysics, and philosophy of science.

216 *Seminar in Kant* (3) Schlagel
Not offered 1962–63. A study of one of Kant's Critiques.

262 *Seminar in Aesthetics* (3) Gauss
Not offered 1962–63. Intensive study in selected problems in the philosophy of art.

299–300 *Thesis* (3–3) The Staff

Related Courses in Other Departments

Classical Languages and Literatures 71–72, *Greek and Roman Backgrounds in Literature* (3–3)

Mathematics 101, *Introduction to Mathematical Logic* (3)

PHYSICAL EDUCATION FOR MEN*

Professors W. H. Myers, J. H. Krupa *(Chairman)*, R. G. Hanken, V. J. DeAngelis
Lecturers Pat Abernethy, W. D. Thompson

Associates W. J. Reinhart, J. V. Camp

First Group

1-2 *Freshman Physical Education* (1–1) The Staff
Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,† $4.50 a semester.

11–12 *Sophomore Physical Education* (1–1) The Staff
Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,† $4.50 a semester.

41 *Personal Health* (1) Krupa
Spring—day. Physical, mental, and social health of the individual—understanding, significance, and promotion. Emphasis on personal health knowledges for the future teacher.

43–44 *Techniques of Physical Education Motor Activities* (2–2) DeAngelis, Krupa
Academic year—day. Fundamental skills, rules, and organization. Locker and towel fee,† $4.50 a semester.

45–46 *Teaching Individual and Dual Sports in Secondary Schools* (2–2) Hanken, Krupa
Academic year—day. Tennis, golf, swimming, wrestling, badminton, bowling. Locker and towel fee,† $4.50 a semester.

* The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the department of Physical Education, and the student assumes full responsibility therefor.
The staff of Instruction here listed is for the academic year 1961-62.
† The locker and towel fee is required for registration in one or more of the activity courses.

47 *Introduction to Physical Education* (2) Myers
Fall—day. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field.

48 *Introduction to Recreation* (2) Hanken
Spring—day. The role of recreation in modern living; current practices in community recreation work; standards of training, experience, and salary; types of leadership.

49 *Human Anatomy* (3) Stallings
Fall—day. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1–2.†

50 *Kinesiology* (3) Lawrence
Spring—day. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

58 *First Aid and Care of Athletic Injuries* (2) DeAngelis
Spring—day. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1–2.†

SECOND GROUP

101 *Physical Education in the Elementary School* (3) Burtner, Snodgrass
Fall—day; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

103 *History and Principles of Physical Education* (3) Myers, Stallings
Fall—day. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

105–6 *Adapted Physical Education and Physical Examinations* (3–3) Lawrence
Academic year—day. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.

107 *Teaching Recreational Dance* (1 to 2) Burtner
Fall—day. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary school age and adult groups. Square-dance calling is included. Locker and towel fee,* $4.50.

109–10 *Leadership Organization in the Intramural Program* (2–2) DeAngelis
Academic year—day. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.

113–14 *Practice in Teaching Physical Education Activities* (2 to 4–2 to 4) Hanken and Staff
Academic year—day. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* $4.50 a semester.

115–16 *Teaching Team Sports in Secondary Schools* (2 to 4–2 to 4) DeAngelis, Hanken
Academic year—day. Football, basketball, baseball, track and field. Locker and towel fee,* $4.50 a semester.

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

117 *Teaching Modern Dance* (1 to 2) Burtner
1962–63 and alternate years: fall—day. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* $4.50.

118 *Dance Production* (1 to 2) Burtner
1962–63 and alternate years: spring—day. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* $4.50.

121 *School and Community Health Programs* (3) Krupa
Fall—evening. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1–2.†

122 *Methods and Materials for Health Education* (3) Stallings
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1–2.†

131 *Tests and and Measurements in Physical Education* (3) Krupa
Fall—day. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

132 *Camp Leadership* (1 to 2) Stallings
Spring—day. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.

136 *Survey of Dance History and Dance Forms* (3) Burtner
1963–64 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnology, dance, practice and discussion of fundamental movement techniques, and composition.

138 *Organization and Administration of Physical Education* (3) Krupa
Spring—evening. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.

151–52 *Recreational Leadership Activities* (1 to 3–1 to 3) Abernethy
1963–64 and alternate years: academic year—evening. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.

161 *Community Organization for Recreation* (3) Thompson
1962–63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.

162 *Administration of Community Recreation Programs* (3) Thompson
1963–64 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may receive credit in either department.

PHYSICAL EDUCATION FOR WOMEN*

Professors Helen Lawrence, Elizabeth Burtner
Associate Professor Loretta Stallings *(Chairman)*
Assistant Professors Lyndale George, Jeanne Snodgrass, Connie Vaughan, Anne Ingram
Lecturers Pat Abernethy, W. D. Thompson
Instructor Donna Abbey
Associate Mabel McEwan

First Group

1–2 *Freshman Physical Education* (1–1) The Staff

Academic year—day. One period of fundamentals of health and physical education and two periods a week chosen from the activities offered each semester.

Fundamentals of health and physical education: one semester on study of the factors involved in the general maintenance of health, efficient use of the body, and fundamentals of movement; one semester on fundamentals of dance.

Activities: badminton, basketball, body mechanics, field hockey, recreational dance, golf, fencing, modern dance, riding, skating, swimming, synchronized swimming, tennis, softball, lifesaving. Locker and towel fee,† $4.50 a semester.

11–12 *Sophomore Physical Education* (1–1) The Staff

Academic year—day. Two periods a week chosen from the activities offered each semester as listed under Physical Education 1–2. Locker and towel fee,* $4.50 a semester.

43–44 *Techniques of Physical Education Motor Activities* (2–2) The Staff

Academic year—as arranged. Fundamental skills, rules, and organization. Locker and towel, fee,† $4.50 a semester.

49 *Human Anatomy* (3) Stallings

Fall—day. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1–2‡

50 *Kinesiology* (3) Lawrence

Spring—day. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

51–52 *Teaching Physical Education Activities* (2–2) The Staff

1963–64 and alternate years: academic year—day. Team sports: basketball, hockey, softball, soccer, speedball. Individual and dual sports: tennis, badminton, archery, swimming and diving, lifesaving and water safety. Gymnastics: tumbling apparatus and trampoline. Locker and towel fee,† $4.50 a semester.

58 *First Aid and Care of Athletic Injuries* (2) DeAngelis

Spring—day. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1–2‡

Second Group

101 *Physical Education in the Elementary School* (3) Burtner, Snodgrass

Fall—day; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activ-

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* The University is not responsible for injuries received in intercollegiate or intramural games or in any of the activities of the departments of Physical Education, and the student assumes full responsibility therefor.

The Staff of Instruction here listed is for the academic year 1961–62.

† The locker and towel fee is required for registration in one or more of the activity courses.

‡ An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

ities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, self-testing activities, and body mechanics.

103 *History and Principles of Physical Education* (3) Stallings, Myers
Fall—day. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

105–6 *Adapted Physical Education and Physical Examinations* (3–3) Lawrence
Academic year—day. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.

107 *Teaching Recreational Dance* (1 to 2) Burtner
Fall—day. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary school age and adult groups. Square-dance calling is included. Locker and towel fee,* $4.50.

111–12 *Teaching Physical Education Activities* (2–2) The Staff
1962–63 and alternate years: academic year—day. Continuation of methods and materials in activities listed under Physical Education 51–52. Locker and towel fee,* $4.50 a semester.

113–14 *Practice in Teaching Physical Education Activities* (2 to 4–2 to 4) The Staff
Academic year—as arranged. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* $4.50 a semester.

117 *Teaching Modern Dance* (1 to 2) Burtner
1962–63 and alternate years: fall—day. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* $4.50.

118 *Dance Production* (1 to 2) Burtner
1962–63 and alternate years: spring—day. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* $4.50.

121 *School and Community Health Programs* (3) Krupa
Fall—evening. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1-2.†

122 *Methods and Materials for Health Education* (3) Stallings
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1–2.†

131 *Tests and and Measurements in Physical Education* (3) Krupa
Fall—day. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

132 *Camp Leadership* (1 to 2) Stallings
Spring—day. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the department of Botany and Zoology. Students may register in either department.

136 *Survey of Dance History and Dance Forms* (3) Burtner
1963–64 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.

138 *Organization and Administration of Physical Education* (3) Stallings
Spring—as arranged. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.

151–52 *Recreational Leadership Activities* (3–3) Abernethy
1963–64 and alternate years: academic year—evening. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.

161 *Community Organization for Recreation* (3) Thompson
1962–63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.

162 *Administration of Community Recreation Programs* (3) Thompson
1962–63 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

PHYSICS*

Professors G. M. Kochl, Lewis Slack†, Herbert Jehle
Associate Professor H. H. Hobbs *(Chairman)*
Associate Professorial Lecturers H. R. Landon, Jr., Herbert Rabin
Assistant Professors S. S. Yeandle, Jr., Margaret Montzka, J. P. Hollinger, G. C. Murray *(Research)*
Lecturers J. N. Tevis, DeWitt Fisher, J. M. Harrison, K. F. Oerlein, W. J. Condell, Jr., J. E. Tompkins

First Group

For a one-year course offering an introduction to the methods and achievements of physical science, see Chemistry 3–4, page 33.

11 *Introductory Physics* (3) Kochl and Staff
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; spring—day and evening; summer 1962. An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, $11.

12 *Introductory Physics* (3) Kochl and Staff
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Spring—day and evening; summer 1962. Mechanics, wave-motion, and sound. Prerequisite: Physics 11. Material fee, $11.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence spring semester 1961–62.

13 *Introductory Physics* (3) The Staff
Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; summer 1962. Elementary electricity and magnetism. Prerequisite: Physics 11. Material fee, $11.

14 *General Physics* (3) The Staff
Lecture (1 hour), recitation (1 hour), laboratory and conference (2¼ hours). Spring—day and evening. Mechanics, wave motion, and sound. Prerequisite: Physics 11, Mathematics 29 or 21. Material fee, $11.

15 *General Physics* (3) Hobbs and Staff
Lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours). Fall—day and evening. Electricity and magnetism. Prerequisite: Physics 14, Mathematics 30 or 22. Material fee, $11.

16 *General Physics* (3) Hobbs
Lecture (2 hours), conference (1 hour). Spring—day and evening. Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30 or 22, and consent of the instructor.

SECOND GROUP

101 *Mechanics* (3) Jehle
1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Statics, elasticity, dynamics of solids and fluids, and gravitation. Prerequisite: Physics 12 or 14, Mathematics 31 or 24.

102 *Heat and Thermodynamics* (3) Yeandle
Fall—evening. Fundamental concepts, heat transfer, the laws of thermodynamics with applications to physical systems. Prerequisite: Physics 16, Mathematics 31 or 24.

105 *Principles of Electricity* (3) Hollinger
1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Elementary d-c and a-c circuit theory, electric and magnetic fields, dielectric and magnetic materials, motion of charged particles in electric and magnetic fields. Prerequisite: Physics 16, Mathematics 31 or 24.

106 *Optics* (3) Koehl
1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Geometrical optics; elementary theory of wave motions; interference, diffraction, polarization, and dispersion of light; laws of black-body radiation. Prereq uisite: Physics 16, Mathematics 31 or 24.

113 *Atomic Physics* (3) Hobbs
1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Properties of elementary particles, interactions with radiation, atomic structure, optical and X-ray spectra, introduction to wave mechanics. Prerequisite: Physics 16, 101 or 105, or the equivalent, Mathematics 31 or 24.

114 *Statistical Physics* (3) Jehle
Spring—evening. Classical and quantum statistics with emphasis on Maxwell Boltzmann statistics; applications to kinetic theory of gases, gaseous diffusion, specific heats of gases and solids. Prerequisite: Physics 16, Mathematics 31 or 24, permission of the instructor.

116 *Quantum and Solid State Physics* (3) Hobbs
Spring—day and evening. Primarily for engineers. Prerequisite: Physics 16, Mathematics 111.

118 *Introduction to Solid State Physics* (3) Rabin
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Dielectric and magnetic properties of solids, electron theory of metals, semiconductors, dislocations, and plastic flow. Prerequisite: Physics 113.

123 *Nuclear Physics* (3) Slack
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Structure and stability of atomic nuclei, nuclear transformations and reactions, radiations of nuclei, fission. Prerequisite: Physics 113.

128 *Sound* (3)
1963–64 and alternate years: spring—evening. Production, propagation, and detection of sound waves; vibrations of sounding bodies; acoustic instruments and acoustic measurements. Prerequisite: Physics 16, Mathematics 31 or 24.

132 *Electronics* (3) Hollinger
Lecture (2 hours), laboratory (3 hours). 1962–63 and alternate years: spring—day. 1963–64 and alternate years: spring—evening. The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications. Prerequisite: Physics 16 and a course in d-c and a-c circuits in Physics or Engineering. Material fee, $11.

153 *Advanced Laboratory in Atomic Physics* (3) Murray
Spring: Saturday—as arranged. Prerequisite: Physics 16. Material fee, $11.

155 *Advanced Laboratory in Electricity and Magnetism* (3)
Not offered 1962–63. Prerequisite: Physics 105. Material fee, $11.

156 *Advanced Laboratory in Optics* (3) Hobbs
Not offered 1962–63. Prerequisite: Physics 106. Material fee, $11.

181 *Biophysics* (3) Yeandle
Spring—evening. Molecular basis of biophysics, biosynthesis, and reproduction. Molecular and genetic aspects of the effects of radiation. Physiochemical equilibria, steady states, and transients in biological systems; order, disorder, and information theory. Admission by permission of the instructor.

191 *Nuclear Reactors* (3) Landon
Fall—evening. Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16, Mathematics 31 or 24.

Third Group

201 *Classical Physical Theory* (3) Jehle
Fall—evening. Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171. (Mathematics 171 may be taken concurrently.)

202 *Classical Physical Theory* (3) Jehle
Spring—evening. Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171.

203–4 *Principles of Modern Physics* (3–3)
Academic year—evening. A critical survey of fundamental topics of modern physics including the theory of relativity, thermal radiation and quantum theory, atomic structure and spectra, wave mechanics, interactions present in multielectron atoms, X ray, the nucleus, properties of matter in bulk. Hobbs

218 *Solid State Physics* (3)
Spring—evening. Tensor properties of crystals. Application of quantum mechanics to problems in solid state physics. Jehle

219–20 *Quantum Mechanics* (3–3)
Academic year—evening. Criticism of classical ideas of mechanics and a formulation of quantum mechanical equations; matrix mechanics and its relation to quantum mechanics; application to various problems of atomic, molecular, and nuclear physics. Prerequisite: Physics 113, 201, 202.

221 *Quantum Electrodynamics and Field Theories* (3) Jehle
1962–63 and alternate years: fall—evening. Variation principles. Relativistic wave equations, quantization of fields, interaction between fields. Scattering theory. S matrix and causality. Prerequisite: Physics 219–20.

222 *Elementary Particles* (3) Jehle
1962–63 and alternate years: spring—evening. Scalar, vector, spinor fields, and elementary particles. Symmetry properties and associated conservation laws. Space inversion and parity, time reflection, charge conjugation. Prerequisite: Physics 219–20.

227 *Irreversible Processes* (3) Yeandle
Spring—evening. Extension of thermodynamic concepts to irreversible processes. Discussion of thermodynamic forces and fluxes, and the Onsager reciprocal relations. Review of the statistical mechanical reasons for assuming the postulate of irreversible thermodynamics. Prerequisite: Physics 102, 114; Mathematics 132 or 112.

255–56 *Graduate Laboratory* (4–4) The Staff
First half: fall—day. *Second half:* not offered 1962–63. Individual work on special topics. One semester of this course is required of all Master's candidates in physics. Students electing this course may begin with Physics 255 or 256. Not open to undergraduates. Material fee, $11 a semester.

291–92 *Seminar: Recent Developments in Physics* (1–1) The Staff
Academic year: alternate weeks—Monday evening. Individual investigations of special problems. All students registered for a Master's degree in physics are expected to attend this seminar during residence for the degree, and to take part in its programs. Credit for participation in the seminar work is obtained by registering for this course during the last two semesters of residence; this credit, however, is based upon the seminar work during the entire period of residence.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged. Fees to be arranged.

PHYSIOLOGY*

Professors C. E. Leese, E. M. Renkin *(Chairman)*
Associate Professor F. P. J. Diecke
Assistant Professors Ruth Henderson, C. S. Tidball *(Research)*, Margret Westecker
Lecturers Eugene Braunwald, J. F. Hoffman, D. P. Rall, R. J. Podolsky
Associates Saul Winegrad, K. A. Hubel, P. C. Nelson, J. H. Mitchell, W. B. Wood, S. E. Downing, E. H. Sonnenblick, W. A. Hagins
Special Lecturers S. J. Sarnoff, J. H. U. Brown

115 *Introduction to Human Physiology* (3) Leese
1962–63 and alternate years: fall—Tues. and Thurs., 8:45 to 10:00 A.M.; 1963–64 and alternate years: fall—Tues. and Thurs., 5:10–6:25 P.M. Lectures on the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of biological science.

190 *Psycho-Physiology* (2) Leese
Spring—Tues. and Thurs., 5:10 P.M. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.

197 *Vertebrate Physiology* (4) Tidball and Staff
Fall—lecture, Mon., Wed., Fri., 11:10 to 12:00 A.M.; laboratory, Fri., 1:10 to 5:00

* The Staff of Instruction here listed is for the academic year 1961–62.

P.M. Fundamental principles of physiology as exemplified in the vertebrates. Prerequisite: Chemistry 11–12; Mathematics 3; and Physics 11, 12; or the equivalent. Laboratory fee, $18.

150 *Medical Physiology* — Renkin and Staff

Spring—lecture 7 hours a week, laboratory 9 hours a week. Lecture and laboratory work in all divisions of physiology. This course is designed for medical students.

170 *General Physiology* (3) — Westecker

Spring—Tues. 11:10 to 12:00 A.M., Thurs. 10:10 to 12:00 A.M. Lectures on basic topics in the physiology of cells and tissues. Prerequisite: Physiology 137 or 150, or Botany 135; and the consent of the instructor.

211–12 *Problems in Physiology* (arr.) — Renkin and Staff

Academic year—as arranged. Directed study under the supervision of a staff member. Prerequisite: Physiology 137, 150, or 232, and the consent of the instructor.

221–22 *Physiology Seminar* (1–1) — Henderson and Staff

Academic year—as arranged. Prerequisite: Physiology 137, 150, or 232, and a reading knowledge of French or German.

232 *Advanced Mammalian Physiology* (10) — Diecke and Staff

Lecture 7 hours a week, laboratory 9 hours a week. Spring—Mon., Wed., Fri., 1:00 to 5:00 P.M.; Tues. and Thurs., 1:00 to 3:00 P.M. Prerequisite: Chemistry 11–12; Mathematics 3; Physics 11, 12; or the equivalent. It is recommended that Biochemistry 221–22 be taken as a prerequisite or concurrently.

259 *Comparative Physiology* (2) — Diecke

1964–65 and every third year: fall—as arranged. Lectures and seminars on topics of current interest in comparative physiology, with emphasis on nonmammalian forms. Prerequisite: Physiology 137, 150, 170, or 232, or Zoology 162; and the consent of the instructor.

265 *Physiology of Cell Membranes* (2) — Renkin

1962–63 and every third year: fall—as arranged. Lectures and seminars on ionic and molecular transport through biological membranes. Prerequisite: Chemistry 111–12 or Physics 181; *and* Physiology 150, 170, or 232, or Botany 135–36; and the consent of the instructor.

281 *Biophysics* (2) — The Staff

1963–64 and every third year: fall—as arranged. Lectures and seminars on biological topics which require development along physical lines. Prerequisite: Chemistry 111–12 or Physics 181 and the consent of the instructor.

295–96 *Research* (arr.) — The Staff

Academic year—as arranged. Prerequisite: Physiology 137 and 170; 150 or 232; or the equivalent.

299–300 *Thesis* (3–3) — The Staff

POLITICAL SCIENCE*

Professors W. R. West *(Emeritus)*, J. W. Brewer *(Chairman)*, W. H. Kraus
Professorial Lecturer F. M. Riddick
Associate Professors H. L. LeBlanc, Benjamin Nimer, H. R. Ludden, C. R. Crowe
Associate Professorial Lecturers William Spencer, R. C. Bain, H. M. Bain
Lecturer C. H. Slayman, Jr.

* The Staff of Instruction here listed is for the academic year 1961–62.

First Group

1 *Introduction to Government** (3) **The Staff**
Fall—day; spring—evening; summer 1962. Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

9–10 *Government of the United States** (3–3) **The Staff**
First half: fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening. *First half:* structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.

Second Group*

104 *State and Local Governments* (3) **LeBlanc**
Spring—day. State, municipal, and other local governmental forms, operations, and problems, with attention to policy formulation and administration, and to the forces of practical politics.

105 *The Governmental Process of the District of Columbia* (3) **LeBlanc**
Not offered 1962–63. Legal structure and political problems of the District of Columbia including restrictions on home rule, Congressional relations, and group politics.

107 *Problems in Modern Political Thought* (3) **Kraus**
Summer 1962. Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.

111 *Introduction to Comparative Government and Politics* (3) **Kraus**
Fall—day; summer 1962. Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.

112 *Introduction to Comparative Government and Politics* (3) **Kraus**
Spring—day. Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.

113 *Political Problems of the British Commonwealth of Nations* (3) **Kraus**
Not offered 1962–63. From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states in Asia and Africa.

117–18 *Political Theory: the Nature and Growth of Political Thought in the West* (3–3) **Kraus**
Academic year—evening. *First half:* from Classical Antiquity to the Middle Ages; the forging of the western political tradition. *Second half:* from the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, and resistance; liberalism, democracy, and conservatism.

120 *Foundations of American Democracy* (3) **Brewer**
1962–63 and alternate years; spring—day. Introduction to political thought in the United States from colonial times to the end of the Civil War period.

121–22 *The Constitution of the United States* (3–3) **West**
Academic year—evening. Judicial power of federal courts in constitutional interpretation. *First half:* emphasis on separation of powers, federal-state relationships, and taxation. *Second half:* emphasis on constitutional protection of civil rights.

125 *Legislative Organization* (3) **Riddick**
1962–63 and alternate years. A study of Congress: constitutional aspects, legal sources of make-up, and political organization. Political and parliamentary practices used in the preparation and enactment of legislation. Not open to students who have credit for former Political Science 124.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

141 *The Development of Legal Institutions* (3) Brewer
1963–64 and alternate years. Introduction to historical jurisprudence: primary attention to the origins of the Roman Law of Continental Europe and of the Anglo-Saxon Common Law.

145 *Political Parties and Politics* (3) LeBlanc
Fall—evening; summer 1962. Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress.

146 *Political Pressures and Public Reactions* (3) Ludden
Spring—evening. Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.

151–52 *Public Administration* (3–3) LeBlanc
First half: fall—day; summer 1962. *Second half:* not offered 1962–63. Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.

157–58 *Current Problems in Domestic Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary issues in internal American politics with discussion of problems and policies.

166 *Field Work in Government* (3) LeBlanc
Fall—as arranged; spring—as arranged. Practical training in the operation of the Federal Government, based on experience through assignment to selected government offices. Students will have an opportunity to observe and participate in government in the Washington area. Open only to students in the Public Affairs curriculum, School of Government, Business, and International Affairs.

171 *International Politics* (3) Ludden, Nimer
Fall—day and evening; summer 1962. Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.

172 *International Organization: the United Nations* (3) Ludden
Spring—day and evening; summer 1962. Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations.

177 *Recent Trends in Latin American Politics and Government* (3) Davis
Fall—day. Types of government, recent developments, and current political conditions in each of the twenty Latin American republics.

178 *International Politics in the Western Hemisphere* (3) Davis
Spring—day. Political relations of the American Republics in the 19th and 20th centuries, the development of Pan Americanism and the Organization of American States.

181–82 *International Law* (3–3) Brewer
Academic year—day and evening; summer 1962—Political Science 181 (3). Surveys of the public law of nations with emphasis on the law of peace. Neutrality and the so-called law of war receive attention in the second semester.

187–88 *Current Problems in International Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary international issues with discussion of problems and policies.

191 *Politics of the Middle East* (3) Nimer
Fall—day. Domestic and international politics of Turkey, Iran, Israel, and the Eastern Arab States and Principalities. Special attention to the specifically regional aspect of the foreign policies of these countries.

192 *Politics of North and Central Africa* (3) Nimer
Spring—day. Domestic and international politics of the Western Arab States, Ethi-

opia, Somalia, Liberia, and the newly independent states of former British, French, and Belgian Africa. Special attention to the specifically regional aspect of the foreign policies of these countries.

194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3) ———

Spring—evening. Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.

197 *Proseminar in International Affairs* (3) Nimer

Fall—evening; spring—day; summer 1962. Reading and discussion course for coordination and review. Primarily for seniors in the International Affairs major.

THIRD GROUP

205–6 *The Federal Executive* (3–3) R. C. Bain

Academic year—evening. *First half:* nomination and election of the U. S. President, his constitutional and political powers; the cabinet and the Executive Office of the President; the relation of the President to the executive and legislative branches of the government. *Second half:* the practical politics of the presidency, presidential policy leadership and control, the President as party head and as moulder of public opinion.

209–10 *Seminar: the Federal Government of the United States* (3–3) ———

1963–64 and alternate years. Advanced research emphasizing legislative problems of Congress and relations of Congress with the Administration.

212 *Seminar: Comparative Government and Politics* (3) Kraus

Spring—evening. Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem. Attention will be directed to questions of method.

213 *Readings in Comparative Government and Politics* (3) Kraus

Fall—evening; summer 1962. Readings and group discussions on methodological questions, comparative political and administrative institutions with attention to legislatures, the changing role of the executive, political parties, constitutional and totalitarian approaches to public management and public service, the role of the military, etc.

217 *Seminar: Topics in Political Theory* (3) Kraus

Fall—evening. Research and discussion on problems of modern political and constitutional theory, theoretical aspects of representative government, democracy, socialism, and totalitarianism. Each semester is devoted to a separately announced topic, such as socialism and communism, theories of resistance and revolution, problems of democratic theory.

220 *Reading Course in Political Theory* (3) Kraus

Spring—evening. Readings and group discussions, principally on modern political and constitutional theory since the 17th and 18th centuries.

221–22 *Seminar: The Constitution of the United States* (3–3) West

1962–63 and alternate years: academic year—evening. Selected topics in the development of the law of the Constitution. Primary attention will be given to the development of "due process of law" in the courts.

245 *Metropolitan Problems* (3) H. M. Bain

Fall—evening. Growth of American cities and changing land use patterns in relation to internal transportation systems. The respective roles of the private automobile and of public transportation. The problems of financing and administering public transportation systems under public and private ownership.

245–46 *The American Political Process: Political Parties and Interest Groups* (3–3) LeBlanc
Academic year—evening. *First half:* readings and group discussions on the nature and functions of political parties and the role and techniques of political interest groups. *Second half:* seminar on selected topics of American politics requiring the use of basic research materials.

271–72 *Problems in International Politics and Organization* (3–3) Ludden
Academic year—day. A seminar to develop techniques of research in recent international affairs and to examine developments in international politics and organizations.

273 *Public Opinion and Foreign Policy* (3) Ludden
Fall—evening. Development, organization, and operation of international information programs by major world powers. Public opinion in the United States influences the formation and conduct of foreign policy.

274 *Methods and Objectives of Foreign Policy* (3)
Spring—evening. Examination of the objectives of foreign policies of the major powers, with attention to political, economic, and military methods used to pursue these objectives. Davis

277 *Seminar: Latin American Government* (3)
Fall—evening; summer 1962. Analysis of the political structures of selected Latin American republics. Two comparable governments studied each year. Davis

278 *Seminar: Latin American Political Philosophy* (3)
Spring—evening. Research in political personalities and philosophies of 19th and 20th century Latin America.

279 *Reading Course in International Affairs* (3)
Fall—evening; summer 1962. Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization. Brewer

281–82 *Seminar: International Law and Relations* (3–3) Research
First half: fall—evening; summer 1962. *Second half:* not offered 1962–63.
in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications.

292 *International Politics and Government in the Middle East* (3) Nimer
Spring—evening. Research and analysis of the international relations and major political problems of the Arab world and adjacent areas.

293–94 *Seminar: International Politics and Government in the Pacific Area* (3–3)
Academic year—evening. Research and analysis of the major patterns of development in internal and international politics of the area, with advanced study of the governmental institutions of the Far East. The Staff

299–300 *Thesis* (3–3)
Academic year—as arranged; summer 1962.

PSYCHOLOGY*

Professors Mitchell Dreese†, Thelma Hunt *(Chairman)*, D. C. Faith
Professorial Lecturers H. F. Hubbard, Margaret Ives, G. H. Mowbray
Associate Professors C. E. Tuthill, W. E. Caldwell, J. N. Mosél, R. D. Walk, Eva Johnson, C. W. Hill, Virginia Kirkbride, L. E. Schlesinger *(Research)*
Associate Professorial Lecturer J. G. Colmen
Assistant Professors R. E. Nolan, Lila Ghent *(Research)*, Jacqueline Goodnow *(Research)*
Lecturer C. J. Lindley
Associate Janet Johnson

First Group

1 *General Psychology*‡ (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. The fundamental principles underlying human behavior.

4 *Psychology of Adjustment* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.

22 *Introduction to Educational Psychology* (3) Dreese, Faith
Fall—evening; spring—day. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3) Johnson
Fall—day; spring—evening; summer 1962. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

98 *Abnormal Psychology* (3) Nolan, Hunt
Fall—day and evening; spring—day; summer 1962. The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.

Second Group§

112 *Adolescent Psychology* (3) Johnson
Fall—day. Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.

115 *Psychology and Language and Communication* (3) Mosél
Fall—day. An introduction to psycholinguistics and verbal behavior. Information theory, the measurement of meaning, cultural and linguistic structures in the perception and learning of language.

118 *Physiological Psychology* (3) Hill
Fall—evening; spring—day; summer 1962. Structure, function, and phylogeny of receptors, nervous system, and effectors as mediators of behavior, including drives, learning, and emotions.

221 *Educational Psychology* (3)
Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.

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*The Staff of Instruction here listed is for the academic year 1961-62.
†On leave of absence, 1961-62.
‡Prerequisite to all other courses in Psychology.
§Six credits in first-group courses are prerequisite to all second-group courses.

129 *Introduction to Counseling and Guidance* (3) Dreese
Fall—evening; summer 1962. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.

131 *Psychological Tests* (3) Hunt
Fall—evening; spring—day; summer 1962. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7.

141 *Leadership, Group Behavior, and Student Life* (3) Faith
Fall—day. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.

144 *Personnel Psychology* (3) Hubbard, Mosél
Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.

146 *Interpersonal Relations* (3) Schlesinger
Fall—day. The psychosocial processes involved in social interaction. The perception of other persons, social communication, small group processes, group problem-solving and change.

148 *Psychology of Advertising and Consumer Behavior* (3) Mosél
1963–64 and alternate years. The motivational and social processes in economic behavior. Consideration of current techniques and findings in motivational research. Evaluation of the effectiveness of mass media, public relations programs, and strategies of persuasion.

151 *Social Psychology* (3) Tuthill
Fall—evening; spring—day; summer 1962. The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.

156 *Psychology of Propaganda and Public Opinion* (3) Tuthill
Spring—evening; summer 1962. The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

161 *Comparative Psychology* (3) Caldwell
Spring—day. A lecture course in animal psychology. Covers psychological processes in infrahuman organisms, evolution of behavior, the place of animal experimentation and research in psychology.

162 *Experimental Comparative Psychology* (3) Caldwell
Fall—as arranged; spring—as arranged. Opportunity for individual psychological experimentation using lower animals as subjects. Offered on independent study plan. Prerequisite: Psychology 161 and permission of the instructor.

191 *Experimental Psychology* (3) Hill, Walk
Fall—day and evening; spring—day and evening. The application of experimental methods to various psychological problems. Prerequisite: 6 credits in psychology and an elementary course in statistics. Material fee, $10.

192 *Problems in Experimental Psychology* (3) Hill, Walk
Fall—as arranged; spring—as arranged. Opportunity for work on individual experimental projects. Prerequisite: Psychology 191 and permission of the instructor.

193–94 *Readings in Psychology* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 193 (3). Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality-point index of 3.00 or higher. Admission by special permission of the instructor.

196 *History and Systems of Psychology* (3) Caldwell
Fall—day; spring—evening; summer 1962. A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology.

THIRD GROUP*

201 *Seminar: Advanced General Psychology* (3) Hill
Fall—day; spring—evening. General review of the field for graduate students with an intensive study of selected problems. Required in all graduate programs.

202 *Psychological Research Methods and Procedures* (3) Walk
Fall—evening; spring—day; summer 1962. Required in all graduate programs. Prerequisites: Experimental Psychology and an elementary course in statistics.

207–8 *Readings in Psychology for Graduate Students* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 207 (3). Supervised readings with conferences on specified topics in psychology. Open only to students who have had course work in the field of the readings.

209 *Seminar: Psychology of Motivation* (3) Caldwell
Fall—evening. A consideration of various theoretical approaches to the psychology of motivation and systematic concepts and experimental findings deriving from each approach.

212 *Personality Evaluation by Projective Techniques* (3) Nolan, Ives
Fall—day; spring—evening. Primary emphasis upon administration and scoring of the Rorschach Test. Prerequisite: Psychology 233.

213 *Clinical Psychometrics* (3) Ives
Spring—evening. A study of the clinical applications of nonprojective tests. Prerequisite: Psychology 233.

215 *Advanced Study of Projective Techniques* (3) Nolan, Ives
Fall—evening; spring—day. Primary emphasis upon interpretation of the Rorschach Test. Prerequisite: Psychology 212.

217 *Seminar: Developmental Psychology* (3) Ghent
Spring—day.

218 *Seminar: Clinical Psychology—Psychopathology* (3) Nolan
Fall—evening; summer 1962. Covers basic etiological factors in behavioral and psychological deviations and disorders.

219 *Seminar: Clinical Psychology—Psychotherapy* (3) Nolan
Spring—day. Covers theoretical principles underlying psychotherapy, techniques and procedures, and problems of evaluation.

220 *Seminar: Abnormal Psychology* (3) Hunt
Fall—day; spring—evening. An intensive study of selected problems in the field of abnormal psychology.

223 *Seminar: Learning* (3) Walk
Fall—day. Covers research and theory in the psychology of learning.

225 *Seminar: Mental Hygiene* (3) Lindley
Fall—evening; spring—day. A study of mental health problems with special attention to needs of counselors.

226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3) Johnson
Spring—evening. A survey of behavior and personality disorders.

* Open only to graduate students, except by special permission of Instructor and Chairman of the Department.

227 *Seminar: Counseling and Guidance* (3) Dress
Spring—evening. Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.

228 *Seminar: Techniques of Counseling* (3) Dress
Fall—evening; spring—evening; summer 1962. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Psychology 229 and 236. In exceptional cases Psychology 229 or 236 may be taken concurrently with 228.

229 *Seminar: Occupational and Educational Information* (3) Faith
Fall—evening; spring—evening. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.

231 *Test Construction* (3) Mosel
Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

233 *Individual Psychological Testing* (3) Johnson
Fall—day; spring—day. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, $7.

234 *Seminar: Test Theory* (3) Mosel
1962–63 and alternate years: fall—evening. Development of the axiomatic-deductive theory underlying the major notions in the construction, evaluation, and application of psychological tests.

235 *Seminar: Psychological Measurement* (3) Hunt
Spring—evening. Advanced instruction in the use and interpretation of psychological tests, with emphasis upon group tests; survey of recent research in psychological measurement. Prerequisite: a course in psychological or educational measurement.

236 *Seminar: Analysis of the Individual for Purposes of Counseling* (3) Faith, ———
Fall—evening; spring—evening; summer 1962. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

244 *Seminar: Job Analysis and Evaluation* (3) Mosel
Summer 1962.

245 *Seminar: Employee Motivation and Morale* (3) Mosel
Spring—evening. An analysis of organizational behavior, especially with regard to motivation and productivity. The implications of recent research on employee attitudes, the primary group, the effects of various patterns of supervisory leadership, the role of formal and informal organization, and job design.

246 *Seminar: Personnel Measurement Techniques* (3) Mosel
Fall—evening. Detailed consideration of the techniques of personnel selection and performance evaluation. The use of employment tests, personal data, assessment interviews, and performance ratings.

249 *Seminar: Human Engineering* (3) Mowbray
Fall—evening. Application of findings and methods of experimental psychology to design and operation of equipment and man-machine systems. Relation of capacities

of the operator to information display systems, control mechanisms, work environment, and work methods.

251 *Seminar: Advanced Social Psychology* (3) Tuthill
Fall—evening. Current research and theory in social psychology; group dynamics, ego-involvements, action research, and social interaction theory.

254 *Seminar: Group Dynamics* (3) Tuthill
1963–64 and alternate years. The experimental study of small groups; autocratic and democratic group climates; interaction process analysis; Lewin's field theoretical approach to individual and group processes.

255 *Seminar: Techniques of Opinion and Attitude Measurements* (3) Tuthill
1962–63 and alternate years: spring—evening. Methods of attitude measurement (interviews, questionnaires, scales, polls) as currently used by private and governmental investigators. The place of attitude studies in schools, industry, government, etc.

258 *Applied Social Psychology* (3) Mosél
Spring—evening. The development of personality, personality adjustment, nature of communication and interaction; structure and functioning of groups, group dynamics, opinion and attitude formation, and opinion and attitude measurement. Classroom activity supplemented by practical observations and projects. Open only to graduate students in hospital administration, engineering administration, and other graduate administrative programs.

261 *Seminar: International Communication* (3) Mosél
1963–64 and alternate years. The communication process, problems in mass communication, measuring and modifying opinions and attitudes, principles of persuasion, psychological warfare.

262 *Dynamics of Social Change* (3) Lippitt
Spring—evening. Current research and theory related to the process of social change. Basic principles of planned change will be explored in connection with individual, group, organization, community, and cultural change. Human factors in the change process will be emphasized.

264 *Sensitivity Training: Human Relations Laboratory Course* (3) Lippitt
Fall—evening; spring—evening. A sensitivity learning experience in human relations. The course is built around an unstructured group experience with opportunities for individual feedback, experimentation, and practice. The goal of the course is the development of self insight, situational sensitivity, and diagnostic skills in human relations. Prerequisite: 9 semester hours in psychology or sociology.

265 *Theory and Design in Human Relations Training* (3) Lippitt
Fall—day. Designed for those interested or involved in conducting human relations training. Theories of learning are reviewed. The laboratory approach to human relations training is explored in depth. Practice in designing, developing training skills, and evaluation of training are covered. Prerequisite: Psychology 264 or a human relations laboratory learning experience.

267 *Theories of Organization* (3) Schlesinger
Spring—day. Theory and research in formal organizations. Classical, human relations, and information processing theories of organizations. The effects of organizational design on communication processes, leadership, decision-making, intergroup relations, small group formation, status hierarchies, productivity, motivation, and morale. Open to graduate students in psychology and graduate administrative programs.

272 *Seminar: Theories of Personality* (3) Caldwell
Fall—evening. A survey of the various theories of personality, with emphasis upon theoretical problems and methodology in the field of personality study.

281 282 *Practicum in Counseling* (3–3) The Staff
Academic year—as arranged, summer 1963—Psychology 281 (3). Supervised practicum in agencies doing counseling. Prerequisite: graduate work in counseling. Admission by permission of the Chairman of the Department.

283–84 *Practicum in Clinical Psychology* (3–3) Nolan
Academic year—as arranged; summer 1962—Psychology 283 (3). Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psychology 212 and 233. Admission by permission of the Chairman of the Department.

289–90 *Seminar: Current Research and Theory in Psychology* (3–3)
Academic year—evening; summer 1962—Psychology 289 (3). A review and discussion of contemporary research and theory in some advanced and specialized field of psychological study, by leaders in the field. The specific topic and instructor for each semester will be announced in advance of the beginning of the semester.

292 *Seminar: Perception* (3) Walk
Spring—evening. Study of current research and theory in the experimental psychology of perception.

295–96 *Research in Psychology* (arr.) The Staff
Academic year—as arranged; summer 1962. Individual research by student, carried out under supervision of staff member.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

RELIGION*

Professors J. R. Sizoo, C. E. Olmstead *(Chairman)*
Professorial Lecturers T. A. Stone, R. E. McNally
Associate Professor R. G. Jones
Associate Professorial Lecturer C. D. Kean
Lecturers A. B. Seidman, E. W. Seaman

First Group

9 *The Old Testament* (3) Jones and Staff
Fall—day and evening; summer 1962. A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities.

10 *The New Testament* (3) Jones and Staff
Spring—day and evening; summer 1962. A study of the literature of the New Testament from the standpoint of occasion, purpose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles.

59–60 *History of Religion* (3–3) Olmstead and Staff
First half: fall—day and evening. *Second half*: spring—day and evening; summer 1962. *First half*: primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. *Second half*: Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status.

Second Group

103 *The Prophets, Their Times and Their Message* (3) Jones
Fall—day. The development of prophetism in the Old Testament; cultural, economic, psychological, and religious factors in the movement; elements of lasting value in the prophetic teaching. A few of the prophets will be selected for particular study.

* The Staff of Instruction here listed is for the academic year 1961–62.

104 *The Life and Thought of Jesus* (3) Kean
Spring—day. A comprehensive study of the life and teachings of Jesus as they relate to problems of belief, standards of value, and patterns of life; the significance of the message of Jesus for our own times.

105 *The Life and Thought of Paul* (3) Kean
Fall—evening. Greek and Hebrew backgrounds of early Christianity, the Roman world of the first century, religious and social conditions affecting the spread of Christianity, the life and journeys of Paul, Paul's teaching and presentation of the Christian faith, the place of the Pauline epistles in the New Testament.

121 *Problems of Western Religious Thought* (3) Olmstead
Fall—day. The nature of religious truth and experience; the existence, character, and activity of God; the predicament of modern man; the problem of evil and suffering; eternal life; science and religion; the meaning of worship; religious views of history.

122 *Christian Ethics and Modern Society* (3) Jones
Spring—day. The nature and principles of the Christian life as developed by the Christian community; problems of personal conduct; the application of the Christian standard to family, social, and economic institutions.

131 *History of Christianity to the Reformation* (3) Olmstead, McNally
Fall—day. The rise and expansion of Christianity, the development of Christian thought, the evolution of church organization and worship, the Renaissance and pre-Reformation dissent.

132 *History of Modern Christianity* (3) Olmstead, McNally
Spring—day. The origin and development of Protestantism; the Roman Catholic revival; the status of the Eastern churches; doctrines, worship, expansion, church and state, and relation to modern thought and life.

135 *History of Judaism to the Talmud* (3) Seaman
Fall—day. A study of the history and religious thought of the Jewish people from the Maccabean revolt to the compilation of the Talmud.

136 *History of Medieval and Modern Judaism* (3) Seaman
Spring—day. A study of the history and religious thought of the Jewish people from the compilation of the Talmud to the present.

141–42 *Religious Education* (3–3) Stone
Not offered 1962–63. Principles and practices of religious education in the home, church, and community; basic educational procedures and special techniques; organization and administration of religious education.

172 *Religion in American Culture* (3) Olmstead
Spring, evening; summer 1962. Growth of religious bodies and institutions in American culture, the heritage of religious freedom and diversity, religion and literature, secularism and education, science and religious thought, divisions and cooperative movements in religion.

Third Group

201–10 *Seminar in Biblical Literature* (3–3) Jones
Academic year—evening. Study of the main problems of Biblical literary and historical criticism.

211–12 *Seminar in Biblical Thought* (3–3) Jones
Not offered 1962–63. Study of the Biblical interpretation of history and reality and its relation to Biblical beliefs about God, man, and the world.

231–32 *Seminar in Early and Medieval Christianity* (3–3) Olmstead, Jones
Academic year—evening. An advanced study of the development of Christian thought from primitive beginnings to the Reformation.

234 *Seminar in Modern Religious Thought* (3) Olmstead
Not offered 1962–63. Analysis of developments in western religious thought fro the 18th century to the present.

241–42 *Seminar in Religious Education* (3–3)
Not offered 1962–63. Advanced course dealing with some of the major problems in the practice of religious education.

271 *Seminar in American Religious History to 1830* (3) Olmstead
Not offered 1962–63. Study of religious thought and life during the colonial and early national period.

273 *Seminar in American Religious History since 1830* (3) Olmstead
Fall—as arranged. Analysis of modern and contemporary trends in American religious thought.

291–92 *Readings and Research* (3–3) The Staff
Academic year—as arranged; summer 1962. Investigation of special problems in the history of religion.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

Related Courses in Other Departments

Art 115, *Christian Iconography* (3)
Classical Languages and Literatures 11–12, *First-year Greek* (3–3)
Classical Languages and Literatures 13–14, *Second-year Greek* (3–3)
Classical Languages and Literatures 21–22, *First-year Classical Hebrew* (3–3)
Classical Languages and Literatures 23–24, *Second-year Classical Hebrew* (3–3)

ROMANCE LANGUAGES AND LITERATURES*

Professors A. T. Deibert *(Emeritus)*, G. E. McSpadden, L. A. Vigneras
Associate Professors Rafael Supervia, J. W. Robb, W. G. Clubb *(Chairman)*, C. Y. Meade, G. E. Mazzeo
Assistant Professors J. L. Metivier, Jr., Carlos Lozano, J. A. Frey
Instructors Elizabeth Neyman, Gérard Huvé, Eulogia Llansa
Language Workshops Supervisor R. T. Tyser

Courses are generally conducted in the language concerned. For General Courses in Romance Languages and Literatures (French, Italian, Portuguese, Spanish) see pages

FRENCH

First Group

1–2 *First-year French* (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

* The Staff of Instruction here listed is for the academic year 1961–62.

3–4 *Second-year French** (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: French 1–2 or two years of high school French.

9–10 *French Conversation and Composition* (3–3) The Staff
Academic year—day and evening; summer 1962. Prerequisite: French 4 or the equivalent and permission of the instructor.

49 *French Readings for Nonmajor Students* (3) Frey and Staff
Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51–52 *Survey of French Literature and Civilization** (3–3) Metivier
Academic year—day and evening. The social, artistic, and cultural background of French civilization. Lectures, readings, recitations, and informal discussions.

SECOND GROUP*

109–10 *Advanced French Conversation and Composition* (3–3) Meade
Academic year—day. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: French 10 or the equivalent and permission of the instructor.

119–20 *French Literature of the Sixteenth Century* (3–3) Metivier
1963–64 and alternate years. Prose, poetry, drama, and memoirs of the French Renaissance; Rabelais, Montaigne, Marot, La Pléiade, etc. Class analysis of texts, collateral reading.

121–22 *French Literature of the Seventeenth Century* (3–3) Clubb
1962–63 and alternate years: academic year—day. History, philosophy, criticism, memoirs, letters, eloquence, drama, fiction, poetry. Class analysis of texts; collateral reading.

123–24 *French Literature of the Eighteenth Century* (3–3) Meade
1963–64 and alternate years. History, philosophy, criticism, letters, drama, fiction, poetry, the "salons", the idea of progress, the idea of science. Class analysis of texts, collateral reading, lectures on literature and history.

125–26 *French Literature of the Nineteenth Century* (3–3) Frey
1962–63 and alternate years: academic year—evening. Romanticism and realism: fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

127–28 *French Literature of the Twentieth Century* (3–3) Clubb
1963–64 and alternate years. Fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

129–30 *Contemporary French Literature* (3–3) Clubb, Meade
Summer 1962—French 129 (3). Existentialism and surrealism in the novel, poetry, and drama from 1938 to the present. Lectures, discussions, and reports.

199–200 *Proseminar: Readings for the Major in French Literature* (3–3) Frey
Academic year—as arranged. Conferences and group discussions.

THIRD GROUP

201 *Doctoral Seminar* (3) Clubb
Fall—day. Introduction to the doctoral program. Methods of research and presentation in the Romance languages and literatures.

* French 3-4 is required, and French 51-52 is recommended, as prerequisite to all second-group courses.

202 *History and Methods of Literary Analysis and Criticism* (3) Meade
Spring—day. Literary criticism from Aristotle to the New Critics. Methods to be demonstrated and applied to selected passages from French literature. Emphasis on technique known as *explication de texte.*

203 *Problems of Pronunciation and Intonation* (3) Vignéras
Fall—day.

212 *Historical French Grammar* (3) Vignéras
Spring—day. Study of phonology, morphology, and syntax of Old French, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second group course in French literature, Romance 279 *Introduction to Romance Philology and Linguistics* (see General Romance Courses), and an elementary knowledge of Latin.

213–14 *Old French* (3–3) Vignéras
Academic year—day. Survey of French literature to the end of the Middle Ages. Prerequisite: a second-group course in French literature and the permission of the instructor.

224 *Seminar: The Age of Rabelais* (3)
1963–64 and alternate years—fall. Humanism and the Reformation in French letters. Rabelais and the *conteurs.* Research projects, papers, reports.

225 *Seminar: The Age of Montaigne* (3)
1964–65 and alternate years—spring. Montaigne: the man and the development of his thought. The literature of the Religious Wars. Research projects, papers, reports.

226 *Seminar: French Poetry from Villon to Malherbe* (3) Frey
1962–63 and alternate years: fall—day. Theories and the practice of the art of poetry in the French Renaissance. The cultivation of a poetic language and the development of genres. Papers, reports.

227 *Seminar: The Renaissance in Europe* (3) Clubb
1964–65 and alternate years—fall. The sources and nature of literary trends in Western Europe from Dante to Calderón, and their relationship to French literature. Readings, papers, and discussion.

231–32 *Theater in the Seventeenth Century* (3–3) Clubb
1962–63 and alternate years: academic year—day. A survey of the development of theatrical arts and the drama. Research papers and reports. Prerequisite: French 121–22 or the equivalent.

233 *Seminar: Seventeenth Century Literary Doctrines* (3) Clubb
Offered 1964–65. The origin and formation of literary doctrines and theories and their relationship to prose, poetry, and drama of the 17th century. Readings, discussions, and papers.

234 *Nondramatic Literature of the Seventeenth Century* (3)
Offered 1963–64. Rationalism and the revolt against authority expressed in literature. Discussion of texts and collateral readings. Meade

240 *The Sentimental Current in the Eighteenth Century* (3)
Offered 1964–65. Sentimentality in the novel and drama of 18th century France. English influences on French authors. The meaning of sentimentality and its later influences. Meade

241 *The Rationalistic Current in the Eighteenth Century* (3)
Offered 1964–65. Bayle, Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and the Encyclopedists as philosophers, dramatists, and critics of their age; an assessment of their contributions to the intellectual evolution of France and Europe. Meade

242 *Seminar: the French Novel in the Eighteenth Century* (3)
Fall—day. Development of the novel in France from *La Princesse de Clèves* to the French Revolution; themes and techniques.

243 *Voltaire and Rousseau* (3) Meade
Spring—day. Voltaire and Rousseau as representatives and critics of their age.

244 *Seminar: Diderot and the Encyclopedia* (3) Meade
Offered 1963–64. Diderot's contribution to 18th century novel, drama, and aesthetic criticism; the Encyclopedia as embodiment of 18th century thinking.

250 *Romanticism in France* (3) Frey
Fall—day. The theory and practice of romanticism in France: romantic love, the Napoleonic myth, exoticism, local color, sensationalism, and religiosity as reflected in new styles of prose and poetry. Romantic criticism. The preparation for realism.

251 *Realism and Naturalism* (3) Frey
Spring—day. Prose style in the French novel from Balzac to Zola; the influence of history, science, philosophy, and art on the literary doctrines of realism and naturalism; realistic currents with romanticism; the minor realists and naturalists; realism in poetry and in the theatre.

252 *Seminar: Flaubert* (3) Frey
Offered 1964–65. Reading and analysis of the works of Flaubert from *Mémoires d'un fou* to *Bouvard et Pécuchet*, plus selected correspondence. Romantic elements in the works of Flaubert; Flaubert and the impersonality of the writer, the doctrine of art for art, Bovarysme, style indirect libre. Contemporary criticism of Flaubert.

253 *Seminar: Symbolism in Poetry* (3) Clubb
Offered 1964–65. The origin and nature of symbolism from Baudelaire to Valéry. Class analysis of texts and reports. Prerequisite: French 127–28 or the equivalent.

254 *Seminar: Victor Hugo* (3) Frey
Offered 1964–65. Hugo and the development of the romantic ideal in prose and poetry; Hugo and romantic theater and criticism. Analysis, classification, and criticism of romantic themes and techniques in the works of Hugo; contemporary Hugo criticism.

255 *Seminar: Stendhal and Le Beylisme* (3) Clubb
Spring—day. Stendhal's novels and autobiographical works. Stendhal and his public. Readings, discussions, and papers.

299 300 *Thesis* (3–3)
Academic year—as arranged. The Staff

SPANISH

First Group

1–2 *First-year Spanish* (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. First half: fall—day and evening; spring—day and evening; summer 1962. Second half: fall—day and evening; spring—day and evening; summer 1962. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester.

3–4 *Second-year Spanish** (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. First half: fall—day and evening; spring—day and evening; summer 1962. Second half: fall—day and evening; spring—day and evening; summer 1962. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester. Prerequisite: Spanish 1–2 or two years of high school Spanish.

5–6 *Spanish Conversation and Composition* (3–3) The Staff
Academic year—day and evening. Prerequisite: Spanish 4 or the equivalent and permission of the instructor.

Spanish 3–4 is required, and Spanish 51–52 is recommended, as prerequisite to all second-group

49 *Spanish Readings for Nonmajor Students* (3) The Staff
Fall—evening; spring—evening. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51–52 *Survey of Spanish Literature and Civilization** (3–3) Supervia
1962–63 and alternate years: academic year—day. 1963–64 and alternate years: academic year—evening. The social, artistic, and cultural background of Spanish civilization. Lectures, readings, recitations, and informal discussion.

SECOND GROUP*

109–10 *Advanced Spanish Conversation and Composition* (3–3) Marzeo
Academic year—day. Normally diction will receive greater emphasis in the first semester and style in the spring semester. Prerequisite: Spanish 10 or the equivalent and permission of the instructor.

121–22 *Spanish Literature of the Golden Age* (3–3) Supervia
1963–64 and alternate years: academic year—day. Lope de Vega, Calderón: the classic drama, the ballad, lyric poetry, prose. Class analysis of texts, collateral reading, lectures on literature and history.

123–24 *Cervantes: Don Quijote* (3–3) McSpadden
1962–63 and alternate years: academic year—day. Life and works of Cervantes; the *Quijote* and its relationship to other works of the Golden Age. Lectures, discussions, and reports.

125–26 *Modern Spanish Literature* (3–3) Marzeo
1963–63 and alternate years: academic year—evening. 1963–64 and alternate years: academic year—day. Prose and poetry of the 18th and 19th centuries. Class analysis of texts, collateral reading, lectures on literature and history.

127–28 *Contemporary Spanish Literature* (3–3) Supervia
1963–64 and alternate years: academic year—day. Prose and poetry of the 20th century. Class analysis of texts, collateral reading, lectures on literature and history.

129 *The Romantic Drama in Spain* (3) Marzeo
Summer 1962 and alternate summers—evening. Class analysis of texts, collateral reading and lectures on the Spanish Romantic Drama.

151–52 *The Spanish-American Novel* (3–3) Robb
1962–63 and every third year: academic year—as arranged. Development of the novel in Spanish America. Lectures, collateral reading, and class analysis of texts.

155–56 *Spanish-American Literature to 1880* (3–3) Robb
1963–64 and every third year. The literature of Spanish America from the colonial period to the latter part of the 19th century. Lectures, collateral reading, reports, and class analysis of important works.

157–58 *Spanish-American Literature since 1880* (3–3) Robb
1964–65 and every third year. The literature of Spanish America from 1880 to the contemporary period. Lectures, collateral reading, reports, and class analysis of important works.

197–98 *Proseminar: Readings for the Major in Spanish-American Literature* (3–3) Lozano
Academic year—as arranged. Conferences and group discussions.

199–200 *Proseminar: Readings for the Major in Spanish Literature* (3–3) Conferences and group discussions.
Academic year—as arranged. Required of all majors.

* Spanish 3-4 is required, and Spanish 51–52 is recommended, as prerequisite to all second-group courses in Spanish.

THIRD GROUP

201 *Doctoral Seminar* (3) The Staff
Fall—day. Introduction to the doctoral program, advanced study and methodology in the Romance languages and literatures.

202 *Explicación de textos* (3) Robb
1962–63 and alternate years: spring—day. An analytical introduction to the study of Spanish and Spanish-American literature. The method will be demonstrated and practiced on selected passages.

212 *Historical Spanish Grammar* (3) McSpadden
Spring—day. Study of phonology, morphology, syntax, and lexicology of Old Spanish, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in Spanish literature, Romance 279 *Introduction to Romance Philology and Linguistics* (see General Romance Courses), and an elementary knowledge of Latin.

214 *Old Spanish* (3) McSpadden
Offered 1964–65. Literature and language: *El poema de Mio Cid, El Conde Lucanor, El Libro de Buen Amor*, etc. Prerequisite, a second-group course in Spanish literature, Romance 279 *Introduction to Romance Philology and Linguistics* (see General Romance Courses), and an elementary knowledge of Latin.

221 *Seminar: Works of Cervantes* (3) McSpadden
Offered 1964–65. Problems of composition, interpretation, criticism, literary history, and aesthetics.

222 *Seminar: Spanish Mystics* (3) Lozano
Offered 1964–65. A study of Spanish mysticism with particular attention to the poetry of Ramon Lull, Fray Luis de Leon, Santa Teresa, San Juan de la Cruz, and other mystics.

223 *Seminar: Drama of the Golden Age* (3) Lozano
Offered 1964–65. A study of the Spanish theater from its beginnings to Calderón. Reading and analysis of representative works of Lope, Tirso, Alarcón, Calderón, and the pre-Lopistas.

225 *Seminar: the Renaissance in Spain* (3) Supervía
Offered 1963–64. A study of the thought and literary currents that led to the Spanish Renaissance and its development.

225 *Seminar: Lyric Poetry of the Golden Age* (3) Supervía
Offered 1963–64. A study of the principal lyric poets from Garcilaso.

226 *Seminar: Picaresque Novel* (3) Lozano
Spring—day. The Picaresque genre in Spain: origin and development and most representative manifestations. Reading and commentary on texts.

241 *Seminar: Spanish Writers of the Eighteenth Century* (3) Mazzeo
Fall—day. Lectures and analysis of principal authors and works; relationships with subsequent literary movements.

242 *Seminar: Spanish Critics and Thinkers of the Eighteenth Century* (3) Mazzeo
Offered 1964–65.

243 *Seminar: Works of Galdos* (3) Supervía
Offered 1964–65. Ideological and stylistic analysis; relationship of his works to the literary movements of the second half of the 19th century.

244 *Seminar: Spanish Romanticism* (3) Mazzeo
Offered 1964–65. Lectures and analysis of principal works and authors. Collateral readings. Problems of origins and developments.

244 *Seminar: the Spanish Novel of the Nineteenth Century* (3) Marco
Offered 1963–64. A study of the leading Spanish novelists of the 19th century. Reading and analysis of important works.

251 *Seminar: Works of Unamuno and Ortega y Gasset* (3) Supervia
Fall—day. A study of the thought of Unamuno and Ortega y Gasset; reading of texts and commentaries.

252 *Seminar: Spanish Literature since the Civil War* (3) Supervia
Spring—day. A study of all literary currents in Spain since the Civil War: drama, prose, poetry.

253 *Seminar: Modernismo* (3) Robb, Lozano
Offered 1963–64. A study of the genesis and development of Modernismo in Hispanic America and Spain with special attention to Spain.

261 *Seminar: Spanish-American Essayists* (3) Robb
Offered 1963–64. The Spanish-American essay as an artistic form, studied in selected modern essayists such as Rodó, Ricardo Rojas, Vasconcelos, Arciniegas

262 *Seminar: Contemporary Spanish-American Poetry* (3) Lozano
Offered 1963–64. Studies of aesthetic principles and poetic movements Emphasis on Huidobro, Neruda, and others.

263 *Seminar: Contemporary Spanish-American Novelists* (3) Robb
Offered 1964–65. Selected contemporary novelists such as Gallegos, Barrios, M. Rojas, J. R. Romero, Carlos Fuentes, Alejo Carpentier.

264 *Seminar: Contemporary Spanish-American Short Story* (3) Robb
Offered 1964–65. Twentieth century *Cuentistas* from Quiroga to J. L. Borges, J. J. Arreola, and others.

266 *Seminar: Alfonso Reyes* (3) Robb
Spring—day. Alfonso Reyes the essayist artist, poet, and complete humanist as studied in his various prose and poetic works

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged

GENERAL COURSES IN ROMANCE LANGUAGES AND LITERATURES

270 *Experimental Phonetics* (3) McSpadden
Offered 1963–64. History; problems and methods of analysis in the physiological and acoustical branches of phonetics and intonation, their application to the Romance languages, and oral aspects of the Romance literatures.

272 *Comparative Romance Languages and Literatures I (Italian)* (3) Lozano
1962–63 and alternate years: fall—day. Intensive study of Italian grammar with reference to French, Spanish, and other Romance languages.

273 *Comparative Romance Languages and Literatures II (Italian)* (3) Clubb
Spring—day. For candidates for the degree of Doctor of Philosophy. The Italian language and literature from Dante to Goldoni. Lectures, discussions, exercises, and readings. Prerequisite: Romance 272 *Comparative Romance Languages and Literatures I* or the equivalent.

275–76 *Comparative Romance Languages and Literatures III–IV (Portuguese)* (3–3) Robb
Academic year—day. For candidates for the degree of Doctor of Philosophy. Lectures, discussions, exercises, and readings.

277–78 *Comparative Romance Languages and Literatures V–VI (Portuguese)* (3–3) Portuguese
Offered 1963–64. For candidates for the degree of Doctor of Philosophy. Portuguese and Brazilian literatures from Camões to the 20th century.

279 *Introduction to Romance Philology and Linguistics* (3) McSpadden
1962–63 and every third year: fall—day. Study of principles found in the development of the Romance languages and methods of analysis at the present time. A general course for graduate students in the fields of the Romance languages and literatures. Prerequisite: an elementary knowledge of Latin. This course is normally followed by French 212 or Spanish 212.

280 *Introduction to Romance Stylistics* (3) Frey
Offered 1964–65. Special emphasis will be placed on examples from French and Spanish literature.

283 *Problems of Teaching Romance Languages and Literatures in College* (3) McSpadden
Fall—day. For candidates for the degree of Doctor of Philosophy. Principles and problems of learning and teaching the language and literature. Apprenticeship in college classes and the language laboratory.

SECRETARIAL STUDIES*

Associate Professor Mildred Shott *(Chairman)*
Lecturer Amil Jackowski
Associates W. R. Throckmorton, Ruth Osborne

1 *Elementary Typewriting* (3) Shott and Staff
Fall—evening; spring—evening. Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms. Laboratory fee, $7.

2 *Intermediate Typewriting* (3) Shott and Staff
Fall—evening; spring—day and evening. The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents. Prerequisite: Secretarial Studies 1 or the equivalent; ability to type accurately at 30 words a minute. Laboratory fee, $7.

11 *Elementary Shorthand and Transcription* (3) Shott and Staff
Fall—day and evening; spring—evening. A study of the principles of Gregg shorthand correlated with dictation and transcription. *Minimum* dictation speed of 60 words a minute attained. Laboratory fee, $3.

12 *Intermediate Shorthand and Transcription* (3) Shott and Staff
Fall—evening; spring—day and evening. Review of the principles of Gregg shorthand. Dictation and transcription on general and specialized business subjects. *Minimum* dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute. Laboratory fee, $5.

15 *Advanced Shorthand, Typewriting, and Transcription* (3) Shott
Fall—day. Dictation and transcription involving vocabularies in specific businesses. *Minimum* speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent. Laboratory fee, $5.

16 *Secretarial Shorthand, Typewriting, and Transcription* (3) Shott
Spring—day. Dictation and transcription involving vocabularies used in the legal and medical professions. *Minimum* dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 15 or the equivalent. Laboratory fee, $5.

21 *Business Correspondence* (3) Shott
240, 63 and alternate years: fall—day. 1963–64 and alternate years: fall—evening.

*The Staff of Instruction here listed is for the academic year 1961–62.

Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.

54 *Secretarial Practice* (3) Shott
Spring—day. A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

SLAVIC LANGUAGES AND LITERATURES *

Associate Professor Helen Yakobson *(Chairman)*
Lecturers Kiril Jaszenko, George Olkhovsky, Vadim Medish, Natalie Kalikin, Irene Bodrov, M. I. Filipovitch

First Group

1–2 *First-year Russian* (3–3) Yakobson and Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening; summer 1962. *Second half:* fall—evening; spring—day and evening; summer 1962. A beginners' course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in electronic language workshop. Workshop fee, $6 a semester.

3–4 *Second-year Russian* (3–3) Yakobson and Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening. *Second half:* fall—evening; spring—day and evening. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Workshop fee, $6 a semester.

9–10 *Russian Conversation* (3–3) Olkhovsky
Academic year—evening; summer 1962. Listening comprehension and oral practice. Prerequisite: Russian 3–4 or permission of the instructor. Workshop fee, $6 a semester.

91–92 *Introduction to Slavic Literature* (3–3) Medish, Filipovitch
Academic year—day and evening. Lecture, recitation, and discussion. *First half:* a survey of Russian literature in translation from early periods through the literary masterpieces of the 19th century. *Second half:* a survey of other Slavic literatures, 18th century to the present, with emphasis on the contemporary scene.

Second Group

101–2 *Readings in Modern Russian* (3–3) Medish
1963–64 and alternate years. Representative Russian readings in the social sciences and periodical literature.

103–4 *Scientific Russian* (3–3) Medish
1963–64 and alternate years. Readings in the major fields of Russian contemporary scientific literature.

109–10 *Advanced Russian Conversation and Composition* (3–3) Yakobson
Academic year—evening. Developing proficiency in oral and written expression. Prerequisite: Russian 10.

* The Staff of Instruction here listed is for the academic year 1961–62.

141–42 *Russian Literature of the 19th Century* (3–3) Yakobson
1962–63 and alternate years: academic year—day and evening. Lectures, special reports, class analysis of selected works of 19th century Russian literature—in Russian. Prerequisite: Russian 1–2, 3–4.

151–52 *Russian Literature of the 20th Century* (3–3) Yakobson
1963–64 and alternate years. Lectures, special reports, class analysis of selected works of 20th century Russian literature—in Russian. Prerequisite: Russian 1–2, 3–4.

179–80 *Advanced Grammar and Composition for Russian Majors* (1–1) Yakobson
Academic year—as arranged.

SOCIOLOGY AND ANTHROPOLOGY*

Professor H. L. Geiserf
Associate Professor R. W. Stephens *(Acting Chairman)*
Assistant Professors J. M. Campbell, Samuel Baum, P. F. Gallagher
Lecturers Jane Wickey, J. A. Bartolini

First Group

1–2 *Man in Modern Society*† (3–3) The Staff
First half: fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening. Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national, and international disorganization.

51 *Introduction to Anthropology*† (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Physical development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships.

Second Group

115 *Cultural Anthropology* (3) Campbell
Fall—day. Development of social life and customs in preliterate societies, universals, and aspects of culture; theories relating to culture, society, and personality.

116 *Native Peoples of the New World* (3) Campbell
Spring—day. A survey of representative Indian groups of the Americas from primitive bands to high civilizations, stressing the patterned nature of diverse cultural responses to universal problems of human existence.

123 *Fields of Social Work* (3)
1963–64 and alternate years. Introduction to the nature and scope of social work; the development of social work programs; functions of social case work, social group work, and social action.

124 *Medical Sociology* (3) Wickey
Spring—day. Sociological factors and processes which relate to physical and mental health and disease; analysis of patterned social relationships in the field of health and medicine; the hospital as a social system.

126 *Urban Sociology* (3) Baum
1962–63 and alternate years: spring—day. The place of the city in the larger society.

* The Staff of Instruction here listed is for the academic year 1961–62.
† Sociology and Anthropology 1 or 51 is prerequisite to all other courses in Sociology and Anthropology.

ciety: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.

127 *Community Organization* (3)
1963–64 and alternate years. Principles common to communities throughout the world: social interaction and social disorganization, population growth and community structure, spatial organization, community change.

131 *Social Institutions* (3)
1963–64 and alternate years. Functional analysis of basic social institutions: family, education, religion, economy, and state in the structure of American society.

Stephens
132 *Courtship and Marriage* (3)
1963–64 and alternate years. Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.

Baum
133 *The Family in Modern Society* (3)
1963–64 and alternate years. Historical development of the family as a social institution, parent-child relations, family problems, disorganization and divorce, and family reorganization.

Stephens
134 *Sociology of Child Development* (3)
1963–64 and alternate years. Socialization of the child through the home and other social institutions; the changing status of childhood, dependent and handicapped children.

Wickey
135 *Juvenile Delinquency* (3)
1962–63 and alternate years: fall—day. Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.

136 *Criminology* (3)
1963–64 and alternate years. Nature and distribution of crime, police and court systems, prisons and reformatories; treatment and prevention of crime.

Baum
141 *Population Problems* (3)
1962–63 and alternate years: fall—day. Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies: eugenics and birth control.

Gallagher
142 *Race and Culture Configurations* (3)
Spring—day. The biological background; the origin and races of mankind, and the social and cultural effects of concepts of race.

Gallagher
143 *Language and Culture* (3)
Summer 1962. The nature and significance of human communication, the distribution and dynamics of languages, linguistic changes, the role of language in culture.

Baum
144 *Mass Communications* (3)
1963–64 and alternate years. The communications process; barriers to communication; structure and function of communication in society; content, control, support, and effects of mass communication.

Stephens
151 *Human Relations in Industry* (3)
1963–64 and alternate years. Sociological analysis of work situations, occupational mobility, development of the labor movement, industrial leadership and morale.

Campbell
152 *Dynamics of Culture* (3)
1962–63 and alternate years: spring—evening. Factors and processes making for stability and change in cultures; "the nature and characteristics of cultural growth invention, diffusion, and acculturation"; the integration and disintegration of cultures.

Gallagher
153 *Culture and Personality* (3)
Fall—evening. Influences of group membership and cultural conditions on personality; socio-cultural factors in mental health; the relationship of personality to class, caste, and occupation.

155 *Applied Anthropology* (3) Gallagher
1962–63 and alternate years: fall—day. The application of anthropological methods and techniques in the modern world. The use of applied anthropology in specific fields, including government, business, law, and medicine.

161 *Social Stratification: Class and Status* (3) Stephens
1962–63 and alternate years: fall—day. Nature of class structure patterns of status, prestige relations in American society, differential class behavior, analysis of comparative social structure and social mobility.

162 *Social Movements* (3) Stephens
1962–63 and alternate years: spring—day; summer 1962. Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and show the way social movements develop.

164 *Social Control* (3)
1963–64 and alternate years. Informal and formal phases of human control, analysis of methods of control used in modern society and the situations in which they occur, policies and techniques of control.

172 *Contemporary Social Theory* (3) Stephens
Spring—evening. Systematic study of the important schools of contemporary sociology, including recent European as well as American developments; an evaluation of the scientific contributions of each school.

181 *Methods of Social Research* (3) Stephens
Fall—evening. Analysis of social research techniques and the scientific method; application to social data of the case study, social survey, statistical, sociometric, and experimental methods.

THIRD GROUP

221 *Seminar: Current Trends in Sociology* (3) Geisert
1962–63 and alternate years: fall—evening. Analysis and evaluation of recent developments in sociology and an appraisal of the role of systematic theory in sociology.

222 *Seminar: Anthropological Theory* (3) Gallagher
1962–63 and alternate years: spring—evening. Analysis of the theoretical postulates and assumptions underlying the development of modern cultural and social anthropology.

223 *Cultural Origins of the Western Hemisphere* (3)
1963–64 and alternate years. An examination of the problems of the nature and time of Early Man's entry to the Americas; the development of Paleo Indian societies, stressing their varied cultural adjustments to diverse environments.

224 *Anthropological Methods* (3)
1963–64 and alternate years. Traditional approaches to library and field research in linguistics, archeology, and ethnography; conceptual bases and bias in the delineation of problems, in the selection, analysis and organization of data, and in the preparation of the final report.

225 *Seminar: Small Groups* (3)
1963–64 and alternate years. General characteristics of small groups and their measurement; sociography of groups, evaluation of small group theory and sociometry; other techniques of small group research.

226 *Problems of Underdeveloped Areas* (3)
1963–64 and alternate years. Characteristics and problems of underdeveloped areas; the interrelationship of demographic, economic, social, and cultural factors; measures and techniques to introduce cultural changes.

227 *Religious Beliefs of Preliterate Peoples* (3) Campbell
1962–63 and alternate years: fall—evening. Conceptions of the supernatural in nonliterate societies. An examination of religious beliefs and practices; the interrelatedness of religion, magic, and philosophy.

228 *Criminal Behavior: Research and Theory* (3) Geisert
1962–63 and alternate years: spring—evening. A re-evaluation of theories of criminal and deviant behavior based on recent research findings; implications for the correction and prevention of criminal behavior.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged: summer 1962.

SPEECH*

Professors L. P. Leggette *(Chairman)*, C. W. Pettit *(Director of Speech Clinic)*, G. F. Henigan, Jr., E. L. Stevens
Professorial Lecturer Zelda Fichandler
Associate Professor Lee Bielski
Associate Professorial Lecturers F. C. Strickland, Zelda Kosh
Lecturers Edith Surrey, A. A. Nilles, S. L. Berlinsky, Isabel Burger, R. E. Shutts, H. C. Krebs, L. W. Shollenberger
Associates Joan Regnell, Lois Richards, Marjorie Prussing

First Group

A *Speech Clinic* Pettit, Bielski
Academic year—as arranged; summer 1962. Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, $7; for group lesson, $4.

B *American Speech for Foreign Students* (3) Bielski
Fall—day and evening; spring—day and evening; summer 1962. Class limited to foreign-born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Recording fee, $5.

1 *Effective Speaking* (3) Leggette and Staff
Fall—day and evening; spring—day and evening; summer 1962. Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, $2.

2 *Persuasive Speaking* (3) Henigan and Staff
Fall—day; spring—day and evening. A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

11 *Voice and Diction* (3) The Staff
Fall—day and evening; spring—day and evening; summer 1962. Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, $4.

32 *Oral Reading* (3) Leggette and Staff
Fall—day; spring—day and evening; summer 1962. Reading to others, theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11. Recording fee, $2.

* The Staff of Instruction here listed is for the academic year 1961–62.

SECOND GROUP

101 *Voice and Phonetics* (3) — Bielski
Fall—day. The International Phonetic Alphabet and its applications to the student's own speech improvement; also its application to such fields as theater, public speaking, speech correction, radio, television, and foreign languages. Prerequisite: Speech 11. Recording fee, $4.

102 *Oral Interpretation of Literature* (3) — Leggette
Spring—day. Theory and practice in the problems of communicating meaning and emotion. Selections for study include poetry and prose. Prerequisite: Speech 32. Recording fee, $2.

111 *Effective Speech Communication* (3) — Bielski
Not offered 1962–63. The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to speech majors.

121 *Group Discussion and Conference Leadership* (3) — Stevens
Fall—day; spring—evening; summer 1962. The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor.

126 *Public Discussion and Debate* (3) — Henigan
Spring—day. Principles and types of public discussion and debate; practice in argumentative speaking on questions of current interest. Prerequisite: 6 hours of speech or the permission of the instructor.

127–28 *Advanced Debate Practice* (1–1) — Henigan
Academic year—as arranged. Admission by permission of the instructor, after one semester of satisfactory participation in the intercollegiate debate program. This course may be repeated for a total of 4 semester hours.

133–34 *Radio and TV Broadcasting* (3–3) — Shollenberger
Academic year—evening. A study of the development of the radio and TV industries, station organization and management, equipment, production techniques; practice in the preparation and performance of radio programs. Recording fee, $5 a semester.

141 *Public Speaking: Advanced Forms* (3) — Henigan
Spring—day. The preparation and presentation of speeches for formal occasions with emphasis on the psychology of the audience. Prerequisite: 6 semester hours of speech.

145 *Speech Criticism* (3) — Henigan
Not offered 1962–63. A study of rhetorical theory with application to the criticism of representative American and British oratory. Admission by permission of the instructor.

153 *Acting* (3) — Strickland
Fall—evening. Study and practice in the fundamentals of acting technique. Prerequisite: Speech 32. Laboratory fee, $5.

154 *Play Production* (3) — Strickland
Spring—evening. Fundamentals of play production. Under the supervision of the instructor, students prepare one-act plays for presentation. Laboratory fee, $5.

155–56 *Play Production Practice* (1–1) — The Staff
Academic year—as arranged. Practical work in theater.

166 *History of the Theater* (3) — Nilles
Spring—evening. A general survey of the rise of the theater, the Classical, Medieval, Renaissance, later English and Continental, and the Modern theater.

169 *Creative Dramatics* (3) — Prussing
Fall—evening. A study of creative dramatics and its use as a learning tool.

170 *Children's Theater* (3) Burger
Spring—evening. Theory and practice in creating and producing plays for children.

171 *Introduction to Speech Correction* (3) Pettit
Fall—evening. A survey of the disorders of speech, including symptomatology, testing, causation, and therapy.

173–74 *Speech Therapy* (3–3) Bielski
Academic year—day. Clinical techniques and procedures involved in the correction of the disorders of speech. Prerequisite: Speech 101 and 171.

176 *Speech Correction* (3) Pettit
Spring—evening. Advanced study of the disorders of speech. Prerequisite: Speech 171 and 173.

177–78 *Clinical Practice in Speech Therapy* (1–1) The Staff
Academic year—as arranged; summer 1962—Speech 177 (1). Supervised case work in remedial speech—the University Speech Clinic, Children's Hospital, District of Columbia Crippled Children's Society, and Public School system. Weekly meetings to discuse therapeutic techniques for the common speech problems. This course may be repeated for a total of 4 semester hours. Prerequisite: Speech 101, 171, 173, and permission of the instructor.

182 *Hearing Problems and the Testing of Hearing* (3) Shutts
Fall—evening. A study of the field of audiology with emphasis on the testing of hearing.

183–84 *Clinical Practice in Hearing Therapy* (1–1) The Staff
Academic year—as arranged; summer 1962—Speech 183 (1). Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and Children's Hospital. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of the instructor.

THIRD GROUP

251 *Rehearsal and Performance* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. A course putting into practice the principles and techniques of acting through participation in play rehearsals and performances at the Arena Stage. Admission by audition or interview.

254 *Directing Problems* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Observation and participation in solving the problems involved in directing plays. Admission by interview.

255 *Techniques of Staging* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Application of theory and principles of scene design, costuming, lighting, make-up, and related stage techniques. Admission by interview.

263 *Theater Management* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Theory and practice in the psychology of handling the public: promotion, box office and house management. Admission by interview.

264 *Producing Problems* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. Problems involved in producing community and professional theater. Admission by interview.

279 *Speech Science* (3) Berlinsky
Fall—evening. The anatomy, physiology, physics, and psychology of speech production, with a survey of experimental work.

280 *Speech Pathology* (3) Pettit
Summer 1962. An advanced study of the causes and symptoms of the major physiogenic and psychogenic disorders. Prerequisite: Speech 171 and 176.

284 *Speech Reading and Auditory Training* (3) Shutts
Spring—evening. Theory and practice in speech reading and auditory training with an analysis of methods used for the instruction of hearing handicapped children and adults. Prerequisite: Speech 182.

286 *Seminar in Speech Pathology* (3) Pettit
Spring—evening.

294 *Research in Dramatic Art* (arr.) The Staff
Spring—as arranged.

295–96 *Research in Speech and Hearing* (arr.) The Staff
Summer 1962—Speech 295 (arr).

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

Related Courses in Other Departments

English 125, *Introduction to English Linguistics* (3)
English 135–36, *Shakespeare* (3–3)
English 175–76, *American Drama* (3–3)
English 183–84, *The English Drama* (3–3)
English 235–36, *Studies in Shakespeare and His Contemporaries* (3–3)
Education 134, *Student Teaching in Secondary Schools* (6 to 9)
Education 152, *Teaching Speech* (2 to 4)

STATISTICS*

Professors F. M. Weida *(Emeritus)*, E. H. Johnson, H. F. Bright *(Chairman)*
Professorial Lecturers Solomon Kullback, Samuel Greenhouse
Associate Professorial Lecturers Seymour Geisser, Morton Kupperman, Arnold Heyl
Assistant Professor R. E. Thomas
Lecturers S. J. Armore, Fred Frishman, H. F. Sieber, Jr., W. M. Wolman

First Group†

51 *Introduction to Business and Economic Statistics* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening; summer 1962. Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

52 *Mathematics of Finance* (3) The Staff
Lecture (3 hours). Fall—day and evening; spring—day and evening. Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra.

* The Staff of Instruction here listed is for the academic year 1961–62.
† Of first-group courses, Statistics 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Statistics 52 lies outside of this group, and may be taken for degree credit in combination with any one of the other three.

53 *Introduction to Statistics in Psychology and Education* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

91 *Principles of Statistical Methods** (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening; spring—day. Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

SECOND GROUP

104 *Statistics in Psychology and Education I* (3) Bright
Lecture (2 hours), laboratory (2 hours). Fall—Saturday morning; summer 1962. Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, $9.

105 *Statistics in Psychology and Education II* (3) Bright
Lecture (2 hours), laboratory (2 hours). Spring—Saturday morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53 or 104. Laboratory fee, $9.

106 *Factor Analysis* (3)
Summer 1962. Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, $9.

107 *Statistics for Engineers* (3) The Staff
Fall—evening; spring—evening; summer 1962. Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

109 *Managerial Statistics* (3)
Not offered 1962–63. Role of statistics and the contribution of statistical procedures in various phases of business management with emphasis on the need for and usefulness of the statistical method rather than the mechanics of analysis. Subject matter comprises sources and methods for collecting data, effective forms of presentation, techniques for summarizing and analyzing quantitative and qualitative information, interpretation of and inferences from available data. Admission by permission of the instructor or following Statistics 51.

110 *Quality Control Techniques* (3)
Not offered 1962–63. Applications of probability and distribution theory to industrial control problems; use of quality control charts; acceptance sampling plans; estimation of lot and process characteristics. Prerequisite: Statistics 51 or permission of instructor. Johnson

111 *Business and Economic Statistics I* (3)
Fall—day and evening. Statistical processes as related to the problems of business and economic research with emphasis on decision making under conditions of uncertainty. Topics include averages, dispersion, analysis of variance, correlation, quality control, and index numbers. Prerequisite: Statistics 51 or permission of instructor. Johnson

112 *Business and Economic Statistics II* (3)
Spring—day and evening. Specific problems of business and economics with statistics as a tool of analysis. Introduction to principles and use of linear programming.

* Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

game theory and queueing theory techniques. Study of various economic relationships, including demand, supply, cost and price functions. Prerequisite: Statistics 111 or equivalent.

117 *Analysis of Variance I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening. The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Prerequisite: Statistics 91. Laboratory fee, $9.

118 *Correlation and the Chi-square Test I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Spring—evening; summer 1962. Regression and correlation theory: simple, partial, and multiple; nonparametric methods; analysis of covariance; contingency table analysis; tests of goodness of fit. Prerequisite: Statistics 91. Laboratory fee, $9.

121 *Index Numbers* (3)
Not offered 1962–63. Definition and theory of index numbers, methods of construction, their interpretation, use, and limitations. Prerequisite: Statistics 51 or the equivalent.

122 *Forecasting Principles and Techniques* (3) Johnson
Spring—day. Survey and appraisal of techniques for measuring the state of business conditions and an examination of current indicators. Study of procedures for estimating future values: budget requirements, price levels, or level of general business activity. Prerequisite: Statistics 51 or the equivalent.

123 *Introduction to Econometrics* (3) Johnson
Fall—day. A basic quantitative approach to fundamental problems in economic theory involving the use of statistical processes, simple model construction, and probability considerations. Prerequisite: elementary course in Economics and Statistics.

155 *Introduction to Mathematical Probability* (3) The Staff
Fall—day; spring—evening; summer 1962. Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers. Prerequisite: permission of instructor.

157–58 *Mathematical Statistics* (3–3) Kupperman
Academic year—day and evening. Distribution theory, sampling theory, estimation, hypothesis testing, confidence methods, regression analysis, experimental design. Prerequisite: differential and integral calculus.

189–90 *Mathematical Probability and Applications* (3–3) Geisser
Academic year—evening. Combinatorial analysis, conditional probability and stochastic independence, probability distributions, laws of large numbers, recurrent events, random walks, Markov chains, simple time-dependent stochastic processes. Prerequisite: Statistics 155 or permission of instructor.

191 *Statistical Mathematics I** (3) Bright
Fall—evening. Problems in statistics with the development of processes from modern algebra necessary for their solution. Prerequisite: differential and integral calculus or permission of instructor.

192 *Statistical Mathematics II* (3)
Lecture (2 hours), laboratory (2 hours). Not offered 1962–63. Linear computations as applied to least squares, multiple correlation, regression, and analysis of variance problems. Prerequisite: Statistics 191 or the equivalent. Laboratory fee, $9.

193 *Statistical Mathematics III** (3) The Staff
Spring—evening. Problems in statistics with the development of real variable theory necessary for their solution. Prerequisite: differential and integral calculus.

194 *Statistical Mathematics IV** (3) The Staff
Fall—evening. Problems in statistics with the development of complex variable theory necessary for their solution. Prerequisite: differential and integral calculus.

195–96 *Reading and Research in Statistics* (arr.) The Staff
Academic year—as arranged.

199–200 *Proseminar: Theoretical and Applied Statistics* (3–3) The Staff
Not offered 1962–63. In addition to the study of recent advances in statistical methods, this course is designed to coordinate the content of the baccalaureate major. Admission by permission of the instructor.

THIRD GROUP*

201 *Design of Experiments* (3)
Not offered 1962–63. Relative merits of random, repeated, stratified, and double sampling; Fisher-Pitman method of randomization; randomized blocks; Latin squares; factorial design; confounding, partial confounding.

203–4 *The Theory of Econometrics* (3–3)
A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. Statistical methods applied to analysis of production, supply, and demand; utility and disutility; interest and taxation; exchange. Emphasis on interpretation of results in terms of probability, correlation, and regression of time series. Admission by permission of the instructor.

205–6 *Advanced Business and Economic Statistics* (3–3)
Not offered 1962–63. Application of statistical methods to specific problems utilizing case method when possible. Emphasis on source materials, role of statistical methods, techniques of analysis, interpretation and presentation of results. Original work is required of each student. Prerequisite: Statistics 112 or the equivalent.

207 *Operations Analysis* (3) Bright
Fall—evening. Basic concepts and techniques of operations analysis as applied to problems in business management and economic research. An introduction to the processes of linear programming, game theory, and queueing theory. Admission by permission of the instructor.

211 *Theory of Sampling* (3) Bright
Spring—evening. Problems of sampling and sample design. Admission by permission of the instructor.

212 *Nonparametric Statistical Inference* (3)
Not offered 1962–63. Spring—1964. Statistical inference when the form of the underlying distribution is unknown; sign tests; rank order statistics; theory of runs; nonparametric discriminant analysis.

217 *Analysis of Variance II* (3)
Not offered 1962–63. Advanced theory of the applications of the linear hypothesis to research problems. Distributions of the analysis of variance. Extensions to multiple classifications with unequal cell frequencies. Studies of multiple contrasts and their importance. Normal versus non-normal problems.

218 *Correlation and the Chi-square Test II* (3)
Not offered 1962–63. Spring 1965. Theoretical analysis of simple, partial, and multiple regression. Examination of various distributions encountered. Rank correlation techniques and their distributions. Distribution of the chi-square statistic.

257–58 *Advanced Mathematical Statistics* (3–3) Kupperman
Academic year—evening. Random variables and probability distributions, distribution functions and their properties, convergence theorems, regression and correlation, multivariate normal distribution, asymptotic and exact sampling distributions, estimation, hypothesis testing.

259–60 *Advanced Mathematical Probability* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Modern theories and asymptotic laws; elementary theory of definite integration; limit theorems in probability.

* Statistics 191, 193, and 194 or the equivalent are prerequisite to all third-group courses.

261–62 *Information Theory for Engineers* (3–3) **Kullback**
Academic year—evening. The elements of information theory and its statistical and probabilistic background from an elementary point of view (nonmeasure-theoretic). Measures of information, entropy, and their properties. Discrete stochastic sources, message ensembles. The transmission of information, channels, channel capacity. Encoding and decoding including error detection and correction. The fundamental theorems of information theory.

263–64 *Statistical Inference* (3–3) **Greenhouse**
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Sample space; methods for estimating population parameters; fiducial inference and its application to testing hypotheses; valid, efficient, and exact estimation; Student's distribution; variance distribution; sampling statistics. Prerequisite or concurrent registration: Statistics 257–58 or the equivalent.

265–66 *Multivariate Analysis* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Tests of significance, generalized variance and covariance, tests of independence, canonical and vector correlations, multivariate, normal distribution, generalized Student's ratio, problems of estimation, applications to factor analysis.

267–68 *Characteristic Functions* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Fourier integrals, set functions, inversion formulas, limit theorems, applications to the distribution problem in statistics.

269 *Sequential Testing* (3)
Not offered 1962–63.

270 *Statistical Decision Theory* (3)
Not offered 1962–63.

271–72 *Statistical Information Theory* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shanon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing. Asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison or experiments.

273–74 *Stochastic Processes* (3–3) **Kullback**
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Fundamental notions of stochastic processes; random walks; Markov processes; differential processes; Gaussian processes; applications.

295–96 *Reading and Research* (3–3) **The Staff**
Academic year—as arranged. Admission by permission of the instructor.

299–300 *Thesis* (3–3) **The Staff**

ZOOLOGY*

Professors I. B. Hansen *(Chairman)*, P. W. Bowman, Edith Mortensen, S. C. Munson
Professorial Lecturer K. C. Kates
Associate Professor A. H. Desmond
Lecturer J. R. Buchheit

* The Staff of Instruction here listed is for the academic year 1961–62.

BIOLOGY*

First Group

1–2 *Introductory Biology† (4–4)** The Staff

An interdepartmental course. Lecture (2 hours), laboratory (4 hours).
Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.
Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.
This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

ZOOLOGY

Second Group*

101–2 *Invertebrate Zoology* (3–3) Mortensen

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. A systematic study of invertebrate forms, including the morphology, classifications, life histories, and phylogenetic relationships. Material fee, $8 a semester.

103–4 *Comparative Vertebrate Anatomy* (3–3) Desmond

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: academic year—day and evening; 1963–64 and alternate years: academic year—day. Lectures on the organ systems of the vertebrates, laboratory dissections of types. Material fee, $11 a semester.

107–8 *Organic Evolution*† (3–3) Bowman

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. A study of the theories of organic evolution and present ideas on the principle lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechanisms involved in this process from the fields of genetics and cytology.

115–16 *Cytology*† (3–3) Bowman

Lecture and laboratory. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—Zoology 115 (3) (as Biology 115). Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Material fee, $8 a semester.

127 *Genetics*† (3)

Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man. Shropshire

140 *Cell Physiology*† (3)

Spring—evening. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12. Hansen

145 *Introduction to Vertebrate Embryology* (3)

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—day and evening; summer 1962. Origin and early de-

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* Biology 1–2 is prerequisite to all second-group courses in Zoology, except by permission of the instructor.

Beginning with the academic year 1962–63, Biology 1–2 *Introductory Biology* (4–4) replaces Botany 1–2 *General Botany* (3–3) and Zoology 1–2 *Introduction to Zoology* (4–4). Botany 1–2 and Zoology 1–2 will be offered for the last time in the summer of 1962.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

velopment of the individual, formation of organ systems. Emphasis on the frog, chick, and pig, with reference to the human embryo. Material fee, $11.

148 *Histology* (3) — Desmond
Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. An introduction to the microscopical anatomy of normal tissues and organs. Material fee, $11.

152 *Protozoa* (3) — Mortensen
Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. Introduction to the protozoa: classification, life histories, and physiology, with special emphasis on free-living types. Material fee, $8.

155 *Parasitology* (3) — Kates
Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. An introduction to the study of animal parasitology, with a survey of parasitic types from the protozoa through arthropods. Material fee, $11.

161 *Entomology* (3) — Munson
Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. A study of the elementary morphology, physiology, and ecology of insects, with an introduction to the taxonomy of the more important groups. Material fee, $8.

162 *Insect Physiology* (3) — Munson
1963–64 and alternate years. Lectures and laboratory work on the physiology of insects. Admission by permission of the instructor. Material fee, $11.

171–72 *Special Problems* (3–3) — The Staff
Academic year—as arranged. Written approval of the instructor is required. Material fee, $11 a semester.

199–200 *Proseminar* (3–3) — The Staff
Academic year—day and evening. Designed to correlate and supplement the work of Zoology majors.

Third Group

201–2 *Seminar: Cytology** (3–3) — Bowman
Academic year—evening.

204 *Seminar in Invertebrate Zoology* (3) — Mortensen
1962–63 and alternate years: spring—evening. A study of original publications on hormones of invertebrate animals.

214 *Advanced Invertebrate Zoology* (3) — Mortensen
Not offered 1962–63. Lectures and laboratory work on problems in invertebrate physiology. Prerequisite: Zoology 101–2 or the equivalent. Material fee, $8.

247–48 *Morphogenesis* (3–3) — Hansen
1962–63 and alternate years: academic year—evening. Lectures and class reports on experimental morphology. Prerequisite: Zoology 103–4 or the equivalent.

251 *Seminar in Vertebrate Zoology* (3) — Desmond
1963–64 and alternate years. A study of current publications in the field of histophysiology.

295–96 *Research* (arr.) — The Staff
Academic year—as arranged; summer 1962—Zoology 295 (3). Investigation of special problems.

299–300 *Thesis* (3–3) — The Staff
Academic year—as arranged; summer 1962—Zoology 299 (3).

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Columbian College of Arts and Sciences: Associate in Arts (A.A.), Associate in Science (A.S.), Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)

Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

National Law Center:

Law School: Bachelor of Laws (LL.B.)

Graduate School of Public Law: Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L. (Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

School of Engineering: Engineering Technologist Certificate (Eng. Tech. Cert.), Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.)

School of Education: **Bachelor of Arts in Education (A.B. in Ed.)**, Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)

School of Government, Business, and International Affairs: **Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.)**, Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: **Associate in Arts (A.A.), Associate in Science (A.S.)**, Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.)

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Division of University Students	Director of Admissions
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General Catalogue of the University	Director of Admissions
Graduate Council	Dean of the Graduate Council
Law School	Director of Admissions
School of Education	Director of Admissions
School of Engineering	Dean of the School of Engineering
School of Government, Business, and International Affairs	Director of Admissions
School of Medicine	Director of Admissions
Summer Sessions	Dean of the Summer Sessions
Schedule of Classes: Fall and Spring Semesters	Registrar
Schedule of Classes: Summer Sessions	Dean of the Summer Sessions

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1959

THE LAW SCHOOL, 1865

THE GRADUATE SCHOOL OF PUBLIC LAW, 1959

THE SCHOOL OF ENGINEERING, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF SPECIAL STUDENTS, 1944

THE DIVISION OF AIR SCIENCE, 1951

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

The George Washington University

Bulletin



COLUMBIAN COLLEGE OF ARTS AND SCIENCES

1962-63

WASHINGTON 6, D. C.
JANUARY 1962
Vol. LXI No. 7

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

Admission	Director of Admissions, Building C
Air Science (ROTC)	Director of Air Science, Chapin Hall
Alumni Association	Alumni Office, Bacon Hall
Foreign Students	Adviser to Foreign Students, Building T
Graduate Study	
In Arts and Sciences	
Master's degrees	Dean of Columbian College of Arts and Sciences
Doctor of Philosophy	Dean of The Graduate Council
In Education	Dean of The School of Education
In Engineering	Committee on Graduate Studies, School of Engineering
In Law	Dean of The Graduate School of Public Law
In Accounting, Business Administration, Business and Economic Statistics, Economic Policy, Hospital Administration, International Affairs, Personnel Administration, Public Administration, Public Affairs	Dean of The School of Government, Business, and International Affairs
Housing	
Men	Director of Men's Activities, Building Q
Women	Director of Women's Activities, Woodhull House
Scholarships	Chairman, Committee on Scholarships, Building T
Student Employment	Student Placement Office, 2114 G Street NW.
Summer Sessions	Dean of the Summer Sessions, Building T
Transcripts of Records	Registrar, Building C
Veterans Education	Director of Veterans Education, Building Q

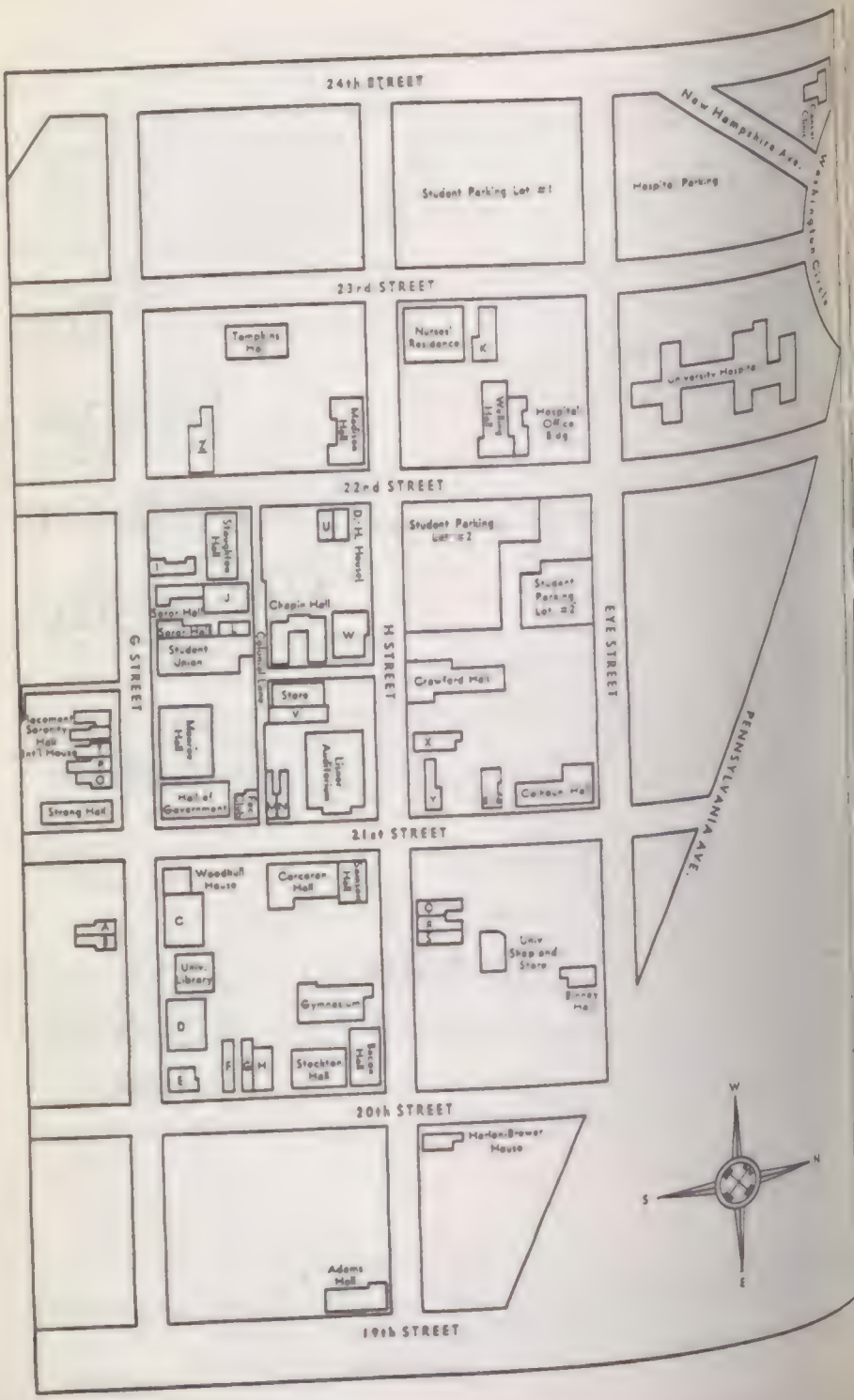
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The George Washington University

Bulletin

COLUMBIAN COLLEGE OF
ARTS AND SCIENCES
1962-63

VOLUME LXI JANUARY 1962 NUMBER 7


24th STREET
New Hampshire Ave.
Washington Circle
Student Parking Lot #1
Hospital Parking
23rd STREET
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Madison Hall
Nurses' Residence
K
Watkins Hall
Hospital Office Bldg
University Hospital
22nd STREET
Stoughton Hall
D. H. Hurst
Chapin Hall
W
Student Union
Colonial Lane
Store
V
Monroe Hall
Lisner Auditorium
Hall of Government
Student Parking Lot #2
Student Parking Lot #3
Crawford Hall
X
Y
Corcoran Hall
G STREET
H STREET
EYE STREET
PENNSYLVANIA AVE.
Basement Sorority Hall Int'l House
Strong Hall
21st STREET
Woodhull House
Corcoran Hall
Samson Hall
C
Univ. Library
Gymnasium
D
Univ. Shop and Store
Bixby Hall
F
G
H
Stockton Hall
Bacon Hall
20th STREET
Morton-Brewer House
Adams Hall
19th STREET
W
N
S
E

CONTENTS

	Page
Calendar of Columbian College of Arts and Sciences	v
The Board of Trustees	1
Officers of Administration	2
The University	3
History and Organization, Academic Status, Location	3
Educational Facilities	4
Columbian College of Arts and Sciences	6
Faculty and Staff of Instruction	6
Committees	11
Admission	13
Registration	16
Fees and Financial Regulations	16
Fellowships, Scholarships, Prizes, and Financial Aid	19
Regulations	23
The Lower Division	29
The Upper Division	37
The Graduate Division	42
Veterans Education	45
Air Force Reserve Officers' Training Corps	46
Health Administration	47
The Reading Clinic	48
The Testing and Counseling Center	48
Student Life	48
Courses of Instruction	54
Anatomy	54
Art	55
Biochemistry	60
Biology	61
Botany	62
Chemistry	64
Classical Languages and Literatures	68

Page

Economics 69
English 73
Geography 78
Geology 82
Germanic Languages and Literatures 84
History 86
Journalism 91
Mathematics 92
Microbiology 96
Pathology 98
Pharmacology 99
Philosophy 100
Physics 102
Physiology 105
Political Science 107
Psychology 111
Religion 117
Romance Languages and Literatures 120
Slavic Languages and Literatures 127
Sociology and Anthropology 130
Speech 132
Statistics 136
Zoology 141

COURSES FROM OTHER DEPARTMENTS 143
Accounting 144
Air Science 145
Business Administration 146
Home Economics 147
Physical Education for Men 148
Physical Education for Women 149
Secretarial Studies 150

INDEX 151

THE CALENDAR

1962

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
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August

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October

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November

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July

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August

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September

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October

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November

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December

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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	....	....	....	....

THE CALENDAR 1962–63

Fall Semester:	
Advising: freshmen, sophomores, all new students	Sept. 10–19 ..... Mon.–Wed.
Orientation Assembly: all new students	Sept. 14 ..... Fri.
Curriculum assemblies: new students attend one	Sept. 14 and 17 ..... Fri. and Mon.
Placement tests	Sept. 18 ..... Tues.
Qualifying examinations	Sept. 18 ..... Tues.
Registration	Sept. 20–22* ..... Thurs.–Sat.
Classes begin	Sept. 24 ..... Mon.
Subjects of Master's theses of Feb. candidates due in Dean's Office	Oct. 5 ..... Fri.
Application for Feb. graduation due in Registrar's Office	Oct. 31 ..... Wed.
Veterans Day. Holiday	Nov. 12 ..... Mon.
Thanksgiving recess	Nov. 22–24 ..... Thurs.–Sat.
Graduate Record Examination	Dec. 8 ..... Sat.
Christmas recess	Dec. 22–Jan. 2 ..... Sat.–Wed.
Classes resume	Jan. 3 ..... Thurs.
Master's theses of Feb. candidates due in Dean's Office	Jan. 3 ..... Thurs.
Last day of fall-semester classes	Jan. 16 ..... Wed.
Examination period	Jan. 21–26 ..... Mon.–Sat.
Spring Semester:	
Placement tests	Jan. 30 ..... Wed.
Qualifying examinations	Jan. 30 ..... Wed.
Registration	Jan. 31–Feb. 2† ..... Thurs.–Sat.
Spring-semester classes begin	Feb. 4 ..... Mon.
Subjects of Master's theses of June candidates due in Dean's Office	Feb. 8 ..... Fri.
Winter Convocation. Holiday	Feb. 22 ..... Fri.
Application for June graduation due in Registrar's Office	Feb. 28 ..... Thurs.
Application for 1963–64 fellowships due	March 1 ..... Fri.
Application for 1963–64 scholarships due	April 1 ..... Mon.
Graduate Record Examination	April 6 ..... Sat.
Easter recess	April 12–17 ..... Fri.–Wed.
Master's theses of June candidates due in Dean's Office	May 1 ..... Wed.
Last day of spring-semester classes	May 15 ..... Wed.
Examination period	May 20–25 ..... Mon.–Sat.
Memorial Day. Holiday	May 30 ..... Thurs.
Baccalaureate Service	June 2 ..... Sun.
Commencement	June 5 ..... Wed.
Summer Sessions:	
Registration for eight-week term	June 17 ..... Mon.
Classes begin	June 18 ..... Tues.
Independence Day. Holiday	July 4 ..... Thurs.
Eight-week term ends	Aug. 9 ..... Fri.
Registration for Fall Semester 1963–64	Sept. 19–21 ..... Thurs.–Sat.

* September 20 and 21, from 12:00 to 8:00 P.M.; September 22, from 10:00 A.M. to 1:00 P.M.

† January 31 and February 1, from 12:00 to 8:00 P.M.; February 2, from 10:00 A.M. to 1:00 P.M.

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The Board of Trustees of the University is composed of the President of the University ex officio and the following persons by election:

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William Lewis Turner, Ph.D., *Assistant Dean in Columbian College of Arts and Sciences*
James Cecil King, Ph.D., *Assistant Dean in Columbian College of Arts and Sciences*

* For the academic year 1961–62.

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington.

The purpose of The George Washington University expressed in the words of the Bill of Incorporation, introduced and subsequently enacted by Congress in 1821, was to realize "the aspirations of Washington, Jefferson, and Madison, for the erection of a university at the seat of the Federal Government." This central idea of a university functioning in the Capital of the Nation, nonsectarian, free of sectional limitations, conscious of its wide American relationships, and open to the ever-increasing international influences which bear upon it, has been continuous through nearly a century and a half.

The purpose of this University, therefore, has been to develop the university ideal in the place of greatest national significance, flexible before the changing needs of its growing national constituency and loyal to the traditional principles of learning and research, in providing through disciplined reason, wisdom for the individual and his society.

The University as it is now organized consists of Columbian College of Arts and Sciences; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools of Medicine; Law; Engineering; Pharmacy; Education; and Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an ex officio member of the Board.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another. The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

LOCATION

The University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

EDUCATIONAL FACILITIES

BUILDINGS

Buildings, grounds, and equipment are valued at approximately $27,000,000.

Bacon Hall, 2000 H Street. Offices of the deans of the Graduate Council and the Graduate School of Public Law, the Dean for Sponsored Research, the Assistant to the President, the Development Division, the Management Research Group, the Educational Counselor; offices and lounge for the Law Faculty; Alumni Office; Alumni Reception Room.

Binney Hall, 2018 Eye Street. The Reading Clinic.

Chapin Hall, 2128 H Street (rear). The Air Force ROTC.

Corcoran Hall, 725 Twenty first Street. Offices of the Treasurer, the Cashier, the departments of Chemistry and Physics; Chemistry Research Project; chemistry and physics laboratories; classrooms.

Faculty Club House, 714 Twenty-first Street.

Gymnasium, 2010–12 H Street.

Hall of Government, 710 Twenty-first Street. Offices of the Dean of the School of Government, Business, and International Affairs; the departments of Accounting, Business and Public Administration, Economics, History, Political Science, Statistics; offices of the Air Force Advanced Management Program and Navy Graduate Financial Management Program; classrooms.

Hospital and Outpatient Department, Washington Circle.

International House, 2110 G Street. Office of the Adviser to Students from Foreign Countries; club rooms.

Lisner Auditorium, 730 Twenty-first Street. The Auditorium, Lisner Lounge, offices and classrooms of the Department of Speech, the Speech Clinic; the housing officer, Athletic Ticket Office.

James Monroe Hall, 2115 G Street. Offices of the deans of Columbian College of Arts and Sciences, the School of Education, the Division of University Students; the departments of Education, English (English and American Literature), Germanic Languages, Journalism, Mathematics, Psychology, Secretarial Studies; classrooms.

Office of the President, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Associate Dean of Faculties, Administrative Secretary.

Placement Office, 2114 G Street.

Residence Halls:

John Quincy Adams Hall, 730 Nineteenth Street. Residence hall for men.

John C. Calhoun Hall, 2100 Eye Street. Residence hall for men.

William H. Crawford Hall, 2119 H Street. Residence hall for women.

Dolly Madison Hall, 736 Twenty-second Street. Residence hall for women.

Hattie M. Strong Hall, 620 Twenty-first Street. Residence hall for women.

Welling Hall, 814 Twenty-second Street. Residence hall for men.

Samson Hall, 2036 H Street. Comptroller's Office; departments of Chemistry, Geology, Physics.

School of Medicine, 1335–39 H Street.

Sorority Halls:

2112 G Street. Apartments of Kappa Alpha Theta and Kappa Delta sororities.

2129 G Street. Apartments of Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Zeta Tau Alpha, and Kappa Kappa Gamma sororities.

2131 G Street. Apartment of Delta Gamma Sorority.

2137 F Street. Apartment of Alpha Epsilon Phi Sorority.

802 Twenty-first Street. Apartment of Phi Sigma Sigma Sorority.

Stockton Hall, 720 Twentieth Street. The Law School.

Student Union, 2125 G Street. Offices of student organizations, cafeteria and snack bar, reading room, lounge, game and music room, "Lost and Found" Office.

Tompkins Hall of Engineering, 725 Twenty-third Street. The School of Engineering.

University Book Store, 2120 H Street.

University Library, 2023 G Street. The library, rooms of the Board of Trustees, Faculty Conference Room, classrooms, Office of the Dean of the National Law Center.

LIBRARY FACILITIES

The Library collections of the University are housed in the University Library and in the departmental libraries of law and medicine.

These collections contain approximately 361,100 volumes—278,600 in the University Library, 58,000 in the Law Library, and 24,500 in the Medical Library. Approximately 10,000 volumes a year are added to the Library's resources. Endowments, supplementing the University appropriation, provide books in the fields of American civilization, American literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive 2,100 periodicals.

Information concerning the use of the Libraries may be obtained at the Library service desks. A classified list on cards of selected recent acquisitions is available at frequent intervals, in addition to the complete information in the card catalogue. Monthly art exhibits are held on the first and second floors of the University Library during the academic year.

The hours of the University Library and the Law Library are Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.; Sunday, 2:00 to 6:00 P.M. The Medical Library is open Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.

The student has access to the Library of Congress, the Public Library of the District of Columbia and its branches, the library of the Pan American Unions, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many of the other great special collections of the government departments.

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

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THOMAS BENJAMIN BROWN, Ph.D., *Professor Emeritus of Physics*
ELBRIDGE COLBY, Ph.D., *Professor Emeritus of Journalism*
IRENE CORNWELL, Ph.D., *Professor Emeritus of French*
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HENRY GRATTAN DOYLE, A.M., LL.D., Litt.D., *Professor Emeritus of Romance Languages*
ROBERT FISKE GRIGGS, Ph.D., *Professor Emeritus of Botany*
AVERETT HOWARD, A.M., *Professor Emeritus of English Composition*
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WARREN REED WEST, Ph.D., *Professor Emeritus of Political Science*
LAWSON EDWIN YOCUM, Ph.D., *Professor Emeritus of Botany*
DONNELL BROOKS YOUNG, Ph.D., *Professor Emeritus of Zoology*

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EDMUND MINOR ARCHER, *Studio Lecturer in Art (Drawing and Painting)*
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ELIZABETH BURTNER, A.M., *Professor of Physical Education for Women*

* The President of the University; the Dean of Faculties; the Dean, Associate Dean, and Assistant Deans of the College; the Registrar of the University, the Director of Admissions of the University; the Professors; Associate Professors; Assistant Professors; and Instructors constitute the Faculty. This listing of Faculty and Staff of Instruction is for the academic year 1961–62.

† On sabbatical leave spring semester 1961–62.

WILLARD EDMUND CALDWELL, Ph.D., *Associate Professor of Psychology*
JOHN MARTIN CAMPBELL, A.B., *Assistant Professor of Sociology and Anthropology*
ROBERT DALE CAMPBELL, Ph.D., *Professor of Geography*
GERALD VINCENT CARROLL, Ph.D., *Associate Professor of Geology*
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JAMES HAROLD COBERLY, Ph.D., *Professor of American Literature*
CHARLES WILLIAM COLE, Ph.D., *Professor of American Literature*
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* On leave of absence 1961–62.

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RAFAEL SUPERVÍA, Doctor en derechio, *Associate Professor of Spanish*
EDITH SHORE SURREY, A.M., *Lecturer in Speech*
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FRED SALISBURY TUPPER, Ph.D., *Professor of English Literature*
WILLIAM LEWIS TURNER, Ph.D., *Associate Professor of English*
CURTIS EDWARD TUTHILL, Ph.D., *Associate Professor of Psychology*

* On leave of absence spring semester 1961–62.

GEORGE VARTKES VAHOUNY, Ph.D., *Assistant Professor of Biochemistry*
BENJAMIN DOUGLAS VAN EVERA, Ph.D., Sc.D., *Professor of Chemistry*
CONNIE SMITH VAUGHAN, B.S., *Assistant Professor of Physical Education for Women*
ROBERT ZENO VAUSE, Ph.D., *Assistant Professor of Mathematics*
ROBERT CORBIN VINCENT, Ph.D., *Professor of Chemistry*
RICHARD DAVID WALK, Ph.D., *Associate Professor of Psychology*
ROBERT HARRIS WALKER, JR., Ph.D., *Associate Professor of American Literature*
HEINZ WARNEKE, *Studio Lecturer in Art (Sculpture)*
DONALD STEVENSON WATSON, Ph.D., *Professor of Economics*
*HAROLD WALTER WESTERMANN, Ph.D., *Associate Professor of Geography*
DAVID GOVER WHITE, B.Chem.Eng., Ph.D., *Associate Professor of Chemistry*
JANE MURRAY WICKEY, A.B., M.S.W., *Lecturer in Sociology*
NORMAN ARTHUR WIEGMANN, Ph.D., *Professor of Mathematics*
ROBERT CRUMPTON WILLSON, A.B., *Associate Professor of Journalism*
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SAMUEL NATHANIEL WRENN, Ph.D., *Professor of Chemistry*
ELIZABETH TRUMAN WRIGHT, A.M., *Assistant Professor of English Composition*
HELEN BATES YAKOBSON, B.S., *Associate Professor of Russian*
STEPHEN SAFFORD YEANDLE, JR., Ph.D., *Assistant Professor of Physics*
RALPH AUBREY YOUNG, Ph.D., *Professorial Lecturer in Economics*

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COMMITTEE ON SCHOLARSHIP

W. L. Turner *(Chairman)*, R. G. Hanken, J. C. King, Muriel McClanahan, J. L. Metivier, Jr., Edith Mortensen, R. C. Vincent

ADVISORY COMMITTEE

G. M. Koehl *(Chairman)*, R. E. Baker, C. W. Bliven, J. C. King, J. H. Krupa, Carol St. Cyr, Mildred Shott, Loretta Stallings, H. G. Sutton, Nancy Tischler, W. L. Turner, R. C. Vincent

UPPER AND GRADUATE DIVISIONS

THE DEAN'S COUNCIL‡

1962: A. H. Desmond, R. C. Vincent; 1963: Gretchen Rogers, W. F. Sager; 1964: R. C. Haskett, C. E. Tuthill

COMMITTEE ON ADMISSION AND ADVANCED STANDING

R. W. Stephens *(Chairman)*, Edith Mortensen *(Secretary)*, C. W. Cole, J. W. Kendrick, W. F. Sager

* On sabbatical leave fall semester 1961–62.
† The Dean of Columbian College of Arts and Sciences is a member ex officio of all committees.
‡ Elected by the Faculty.

COMMITTEE ON THE USE OF CORRECT ENGLISH

R. H. Moore *(Chairman)*, J. G. Allee, Jr., G. F. Henigan, Jr., Muriel McClanahan, R. C. Willson

COMMITTEE ON SCHOLARSHIP

Florence Mears *(Chairman)*, W. G. Clubb, H. M. Merriman, J. P. Reesing, Jr., S. N. Wrenn

COMMITTEE ON STUDIES

C. D. Linton *(Chairman)*, A. H. Desmond, H. L. LeBlanc, William Schmidt, F. S. Tupper

INTRODUCTORY

Columbian College was founded in 1821. James Monroe, then President of the United States, aided in obtaining the charter from Congress which established "The Columbian College in the District of Columbia" for the "sole and exclusive purpose of educating youth in the English, learned and foreign languages, the liberal arts, sciences and literature." Columbian College became Columbian University in 1873. When Congress authorized changing the name to The George Washington University, the name "Columbian College" was given to the college of liberal arts and sciences. In 1961 the name was changed to Columbian College of Arts and Sciences.

Incoming liberal arts and science freshmen and all transfer students of less than junior class standing are registered in the lower division of Columbian College. The lower division also provides the first two years of the prelegal and premedical programs, the preprofessional work required for admission to the schools of Pharmacy; Education; and Government, Business, and International Affairs; and two-year terminal curricula in Accounting, Home Economics, Physical Sciences, and Secretarial Studies. The lower division is primarily concerned with providing (1) the personal and academic guidance needed by beginning college students and (2) the broad cultural foundations in language and literature, science, and social studies on which major field specialization in the upper division is built.

The upper division of Columbian College offers programs leading to Bachelor's degrees in the liberal arts and sciences; the graduate division offers programs leading to the Master's degrees.

Students beginning the first year of graduate study who plan to work toward the degree of Doctor of Philosophy may be given provisional status in the Graduate Council. However, if the student prefers and if the Dean of the Graduate Council so advises, he may register for a Master's degree in Columbian College of Arts and Sciences during the first year and apply for transfer to the Council upon completion of the Master's work.

THE COLUMBIAN COLLEGE PROGRAM

The Columbian College program is a contemporary application of the historic liberal arts tradition. Its purpose is to enable the student to develop harmoniously both his particular abilities and his general awareness as a human being. It de-

mands of the student a thorough acquaintance with one major area of learning and at the same time an understanding of how that field of specialization fits into the larger context of the scientific, social, and moral problems which confront modern man. It stresses not merely expertness but that broadly enlightened expertness which encourages its graduates to grow through the years in ability and wisdom.

ADMISSION

Columbian College accepts both men and women. Students are admitted at the beginning of each semester and summer session.

The right is reserved to refuse admission to any student with an academic record which creates doubt of his ability to succeed in college or who, for any other reason, would not be an acceptable student.

APPLICATION FOR ADMISSION AND READMISSION

Forms for application for admission or readmission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D.C.; telephone: FE 3-0250, extension 344. The application for admission*, with a $10 application fee and a recent, signed photograph, should be returned to the Office of the Director of Admissions.

Application for admission or readmission for degree candidacy, together with all required credentials, should be received by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions to insure consideration. Late applications will be considered only if the application form and all required credentials are received in the Admissions Office no later than two weeks prior to the first day of registration for the semester or session for which application is made. Exceptions may be made under extraordinary circumstances, at the discretion of the Director of Admissions.

Application for admission* to *nondegree status* in the Division of University Students must be received, with a $5 application fee and necessary credentials, no later than the Saturday preceding the first day of registration, as stated in the University calendar.

An applicant from a secondary school must send the high school record form provided by the University to his high school principal, with the request that the completed form be mailed directly *to the Office of the Director of Admissions.*

An applicant who has attended one or more institutions of higher learning must request each registrar to mail directly *to the Office of the Director of Admissions* a transcript of his record, *even though credits were not earned.* If high school units are not shown on the college transcript, the applicant should request his high school to submit a transcript to the Office of the Director of Admissions.

The appropriate report of the Graduate Record Examination, when available, should accompany application for admission to Master's candidacy.

* An application for readmission does not require a fee unless it involves transfer to a college, school, or division of the University other than the one in which the applicant was last registered. In this case, a $5 transfer fee is required.

ADVANCED STANDING

Credit for Advanced Placement Examinations

Up to 30 semester hours of credit may be granted for college-level courses in an approved secondary school, if substantiated by satisfactory performance in the Advanced Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, N. J.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the courses of study completed by the applicant.

Credit from Higher Institutions

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University. It may be allowed provisionally, and it may be withdrawn for subsequent poor work.

The student must be in good standing as to scholarship and conduct. He must be eligible to return to the last previously attended institution in the semester for which he seeks admission to this University.

READMISSION

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded), must apply for readmission in the Office of the Director of Admissions. (See closing dates for application for admission, page 13.) If he applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of the Director of Admissions from each institution attended. Applications for readmission are considered on the basis of regulations currently effective.

ENTRANCE REQUIREMENTS *

Good character and an academic background appropriate for the program of studies contemplated are required.

LOWER DIVISION

Requirements for admission to the freshman class are as follows:

1. An acceptable certificate of graduation from an accredited secondary school, showing at least fifteen "units"†. The program of study *recommended* for students entering in September 1962 and *required* of students entering in February 1963 and thereafter is as follows: four years of English; at least two years of one foreign lan-

* Entrance requirements are established by the faculties of the several colleges, schools, and divisions. The Director of Admissions, as agent for the faculties, administers regulations governing admission, readmission, and transfer.

† A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods, or the equivalent, of prepared classroom work.

guage; two years of science, preferably with laboratory instruction; two years of social study, one of which must be American history; and two years of college preparatory mathematics. It is to be noted that one unit of algebra, or the equivalent, is prerequisite to courses in chemistry, mathematics, physics, and statistics, and that in addition one unit of plane geometry, or the equivalent, is prerequisite to courses in mathematics and physics.

2. The principal's statement that the applicant is prepared to undertake college work.

3. College Entrance Examination Board scores must be submitted on the Scholastic Aptitude Test.

Beginning February 1963 scores must also be submitted on the English Composition Achievement Test. Applicants are urged to submit scores on two additional achievement tests in subjects reflecting their major interests.

It is recommended that the examinations be taken in December or January. Scores on tests taken in the Junior year may be submitted. Arrangement for tests should be made with the College Entrance Examination Board, 20 Nassau Street, Princeton, N. J., not less than one month before the date of the test. In applying for the test, the student should specify that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications of an applicant who, because of unusual circumstances, does not present all the formal requirements stated above. The Committee may prescribe appropriate tests.

UPPER DIVISION

Bachelor of Arts.—Sixty-four hours of academic work based on the *Arts and Letters* curriculum in the lower division, or the equivalent (see page 32).

Bachelor of Science.—Sixty-four hours of academic work based on the *Science* curriculum in the lower division, or the equivalent (see page 32).

Bachelor of Science in Medical Technology.—Sixty-four hours of academic work including Biology 1–2*, Chemistry 11–12, and Microbiology 112, or the equivalent (see page 33).

GRADUATE DIVISION

An approved Bachelor's degree from an accredited higher institution; an appropriate distribution of courses; and a superior quality of work in the major field are required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but he may be required to take extra work.

Applications for admission must be approved by the department and by the Dean.

Master of Arts.—A Bachelor of Arts degree at this University with a major in the chosen field, or the equivalent.

Master of Science.—A Bachelor of Science degree at this University with a major in the chosen field, or the equivalent.

Master of Fine Arts (1) *in the field of Painting or Sculpture.*—A Bachelor of Arts degree at this University with a major in drawing and painting, sculpture, or commercial art, or the equivalent. (2) *In the field of Dramatic Art.*—A Bachelor's degree from an accredited college or university. Desirable undergraduate background

* An interdepartmental course offered by the departments of Botany and Zoology.

includes courses in literature, drama, and the theater. Applicants with academic deficiencies may be enrolled in the program subject to the satisfactory completion of prescribed courses.

REGISTRATION

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions.

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded), must apply for readmission in the Office of Admissions.

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in this University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration.* Allowance of credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

In Residence Registration

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status by paying the appropriate fee, see page 17. For the purpose of this regulation the summer term will be disregarded.

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

Time and Place of Registration

Registration is conducted in Building C, 2029 G Street NW., during the following periods: *fall semester,* September 20 and 21, 12:00 to 8:00 P.M.; September 22, 10:00 A.M. to 1:00 P.M. *Spring semester,* January 31 and February 1, 12:00 to 8:00 P.M., February 2, 10:00 A.M. to 1:00 P.M.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted, effective September 1, 1961:

Tuition Fees	
Full-time program (15 hours or more): for each semester*	$450.00
Part-time program: for each semester hour*	30.00

* Payment of tuition for a Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

Graduation Fees

Wherein the degree of Associate in Arts or Associate in Science is granted	10.00
Wherein a Bachelor's or Master's degree is granted	25.00

Special Fees

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	10.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Admission tests (when required)	6.00–12.00
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree at the time of registration for the final semester of study (excluding summer sessions)	10.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program: dropping or adding a course, changing from one section to another within a course, change of status (from auditor to credit status or vice versa), and change in credit hours for a course	2.00
Withdrawal fee, charged in special cases	5.00
Service fee, charged each student for late payment of tuition (see "Payment of Fees")	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements (see page 16). Due and payable on the official days of registration	30.00
For special physical examination	2.00
For each examination to qualify for advanced standing and for each special examination	5.00
Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor	3.00
Transcript fee, charged for each transcript of record after the first	1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under Health Administration. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

* Payable at the time of application for transfer or readmission.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

With the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration. Installment-due notices are mailed. However, nonreceipt of notice is no excuse for failure to meet obligations when due.

A student who fails to meet payments when due, but pays his fees within the following two weeks of the date on which payment is due, is charged a $2 service fee. A student who fails to meet payments within these two weeks after payment is due is automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of $5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the dean of the college, school, or division in which the student is registered. Notification to an instructor is not an acceptable notice (see "Withdrawal", pages 26 and 27).

In authorized withdrawals and changes in schedule, financial adjustments will be made as follows:

Fall Semester

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of tuition charges.

Spring Semester

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

* The University work week is Monday through Friday, inclusive.

Partial withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

A student enrolled in a full-time program, who drops or adds a course and continues to be in a full-time program, will have no financial adjustments of tuition made other than those involving course fees.

In no case will a refund be made of the first third of the total tuition charges. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

A student in chemistry who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a $3 checkout fee. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Students enrolled in the ROTC who fail to turn in uniforms, equipment, and textbooks, on separation from the Corps, are charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

FELLOWSHIPS, GRADUATE SCHOLARSHIPS, AND ASSISTANTSHIPS

Unless otherwise specified, applications should be submitted not later than March 1 preceding the period for which the award is to be made. They should be directed to the chairman of the department or the dean of the school concerned and addressed to The George Washington University, Washington 6, D. C.

University Teaching Fellowships.—Assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to $2,000 plus full tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction di-

* The University work week is Monday through Friday, inclusive.

recting his doctoral study. Application should be made to the chairman of the department of instruction concerned.

Graduate Teaching Assistantships.—Open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to $2,000 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Application should be made to the chairman of the department of instruction concerned.

Isabella Osborn King Research Fellowships.—Fellowships varying in amount from $750 to $3,000, established in 1927 by bequest of Isabella Osborn King, are offered in the biological sciences and are intended to foster research for which the libraries and scientific establishments in Washington provide special facilities.

National Defense Graduate Fellowships.—Under the National Defense Education Act, fellowships are available at this University in Germanic Languages and Literatures and in Romance Languages and Literatures at $2,000 (with an increase of $200 each for the second and third years) plus $400 a year for each dependent; tuition is waived. Application should be made to the Graduate Council.

National Science Foundation Cooperative Graduate Fellowships.—These fellowships at $2,200 for twelve months or $1,600 for nine months, with tuition waived, are available in the mathematical, physical, medical, biological, and engineering sciences and in certain other fields regarded as employing scientific methods.

Thomas Bradford Sanders Fellowships.—Fellowships in departments of science, varying in amount from $900 to $1,500 plus tuition, established in 1928 by bequest of Addie Sanders in memory of her brother.

SCHOLARSHIPS AND PRIZES

The following scholarships and prizes are limited to students in Columbian College of Arts and Sciences. The University offers many others which are open to Columbian College students. A special bulletin containing a complete list and full information may be obtained from the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded.

Scholarship application should be made in writing on or before April first for the following academic year and, unless otherwise specified, should be addressed to the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C. Awards are made during the month of April. All scholarships begin with the fall semester.

Alpha Zeta Omega Scholarship.—A $500 scholarship established in 1950 by Pi Chapter of Alpha Zeta Omega Pharmaceutical Fraternity. Awarded annually to a member of the graduating class of one of the public high schools of the District of Columbia, nearby Maryland, or Virginia who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Alumni Scholarships.—Five scholarships are available each year in Columbian College of Arts and Sciences, upon recommendation of alumni or regional alumni

clubs, to outstanding graduates from accredited high schools outside the Metropolitan area of Washington, D. C. These scholarships cover tuition for four academic years (exclusive of the Summer Sessions), beginning with the fall semester. Special fees such as laboratory, room, board, or other expenses are not covered. To retain the scholarship, the student must maintain a *B* average.

Byron Andrews Scholarship.—Established in 1920 by Belle Fisk Andrews in memory of her husband. Available "for ambitious and needy students, who desire to pursue courses in English, Latin, journalism, history, literature, or political science".

Crown Photo Scholarship.—A $500 scholarship established in 1958 by the Crown Photo Service of Washington, D. C. Awarded annually to a member of the graduating class of one of the public high schools of the District of Columbia, nearby Maryland, or Virginia, who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

District of Columbia Pharmaceutical Association Scholarship.—A $500 scholarship, established in 1954. Awarded annually to a member of the graduating class of one of the public or parochial high schools of the District of Columbia, nearby Maryland, or Virginia who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Robert Farnham Scholarship.—Established in 1871 by Mrs. Robert Farnham. Available to a student in Columbian College of Arts and Sciences.

Georgetown Business and Professional Women's Club Scholarship.—Established in 1958 by the Georgetown Business and Professional Women's Club. Available to a woman student in the field of science.

Anna Spicker Hampel Scholarship.—Established in 1949 by Evelyn Hampel Young in memory of her mother. Available for scholarship aid to young married women students in the School of Education or Columbian College of Arts and Sciences.

Elma Lewis Harvey Scholarship.—Established in 1921 by Emma Elizabeth Harvey in memory of her daughter. Awarded every four years, or as often as vacant, to a young woman in Columbian College of Arts and Sciences of the Protestant faith and the Caucasian race who shall be selected for scholarship and moral qualifications.

High School Scholarships.—The Board of Trustees offers thirty-four scholarships to graduates of public, private, and parochial high schools in the following Washington Metropolitan Areas: District of Columbia; Fairfax-Falls Church; Alexandria City; Montgomery, Prince Georges, and Arlington counties. One of these scholarships, designated as the *Amos Kendall Scholarship*, was established in 1869 by the Honorable Amos Kendall.

These scholarships are awarded to students who intend to enter the lower division of Columbian College of Arts and Sciences and complete a Bachelor's program at this University. The student must carry a full academic program; in no case is he permitted to carry less than 15 semester hours.

The awards cover full tuition for four academic years (exclusive of the Summer Sessions and special fees). To retain the scholarship, the student must maintain an average of *B* and meet all other standards of the University.

Nominations are made by principals and counselors of participating high schools. Inquiries should be addressed to the high school counselor.

High School Discussion Conference Scholarships.—Three scholarships are available

each year in Columbian College of Arts and Sciences to high school seniors who participate in The George Washington University High School Discussion Program. These scholarships cover tuition for one academic year but do not include special fees. Nominations are made by principals of participating high schools.

Inquiries should be directed to the Department of Speech, The George Washington University.

Kappa Alpha Theta Scholarship.—A $500 scholarship established in 1950 by the Washington alumnae of Kappa Alpha Theta. Available for the training of a clinician in speech correction.

Kappa Kappa Gamma Scholarship.—A $500 scholarship established in 1959 by the Washington, D. C., alumnae of Kappa Kappa Gamma. Awarded annually to a student planning to follow the profession of speech correction.

Newspaper Scholarships.—One scholarship is available each year to a candidate recommended by each of the following newspapers: *The Washington Daily News, The Washington Post,* and *The Evening Star.* The holder of the scholarship must be an employee of the newspaper. These scholarships are valid for four academic years, provided the holder continues in the employ and is recommended by the newspaper, and maintains a satisfactory academic record and a high standard of deportment. They cover tuition but do not include laboratory fees, graduation fees, or other special fees.

Mary Lowell Stone Scholarship.—A memorial scholarship established in 1893. Available to a woman student of science in Columbian College of Arts and Sciences.

Charles Clinton Swisher Scholarships.—Scholarships of $500 and $300, respectively, established in 1941 by bequest of Professor Charles Clinton Swisher. Available, under certain conditions, to students of medieval history.

University Hospital Scholarships in Medical Technology.—Ten scholarships are available, each to cover the cost of 24 semester hours of the 30 in the last year of the curriculum leading to the degree of Bachelor of Science in Medical Technology. Inquiries should be directed to the Department of Pathology, The George Washington University Hospital.

Barbara C. Wendt Scholarship.—A scholarship established in 1961 by the Presidential Chapter of the National Secretaries Association (International) of Washington, D. C., in memory of a former member. Awarded annually to a student in secretarial studies on the basis of academic merit and financial need.

Ellen Woodhull Scholarship.—Established in 1919 by bequest of Ellen M. E. Woodhull. Available to a student in Columbian College of Arts and Sciences.

American Institute of Chemists Prize.—The District of Columbia Chapter of the American Institute of Chemists offers annually a medal and a one-year subscription to *The Chemist* to the graduating student, majoring in chemistry, who excels in scholarship, integrity, and leadership.

Byrne Thurtell Burns Memorial Prize.—Awarded to the senior majoring in chemistry who shows the greatest proficiency in organic chemistry, as evidenced by a comprehensive examination, and who possesses such qualifications of mind, character, and personality as to give promise of future achievement.

Chi Omega Prize.—Offered annually by Phi Alpha Chapter of Chi Omega Fraternity. Awarded to the woman in the graduating class with the highest record in the following social sciences: economics, sociology, political science, and history; combined with general excellence.

FINANCIAL AID

Student Employment

Graduate and undergraduate student assistantships are available in several departments of the University. Application should be made to the chairman of the department of instruction concerned.

The Placement Office maintains a registry of positions available in many fields of work and refers qualified applicants for consideration.

Loan Funds

The following loan funds are available. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students to provide for partial payment of tuition. Applications for these loans shall be made three days prior to the dates on which tuition installments are due.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than July first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

REGULATIONS

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return. (See "In Residence Registration", page 16.)

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

AMOUNT OF WORK

A full-time student who is not on probation may take ordinarily not more than 17 semester hours. A student employed more than 24 hours a week, who is not on probation, may take not more than 10 hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 19 hours. An employed student who meets the same standard may take not more than 12 hours.

A student who accepts employment after registration or at any time during a semester must report that fact immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

The student is held responsible for all the work of the course in which he is registered, and all absences must be excused by the instructor in charge before provision is made for the student to make up work missed. Excessive absence in any course will lead to loss of credit in that course, even though other requirements, such as tests, term papers, and examinations, are met.

A student whose absences from any class, whether excused or unexcused, are in excess of one-fourth of the total number of class periods will receive the grade of *F* for the course, except by special ruling of the Dean on recommendation of the instructor.

SCHOLARSHIP

A student who fails to maintain the scholarship requirements of Columbian College of Arts and Sciences may be dismissed from the University.

Grades

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors.

Undergraduate.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the dean's council of the college, school, or division concerned. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. A student may not repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

Graduate.—For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete).

The Quality-Point Index

Undergraduate scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete record in this University.

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not superseded by a proper grade within the allotted time, it is computed as zero quality points. Grades in courses taken at another institution are not considered in computing the quality-point index.

Examinations

Examinations are scheduled at the end of each semester or at the completion of the course.

Use of Correct English

The use of correct English, oral and written, is required in all courses. Any student whose English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean and to the Committee on the Use of Correct English. The Chairman of the Committee may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed by failure to make up any such deficiency in English to the satisfaction of the Committee and the Dean.

Academic Dishonesty

Evidence of dishonesty on the part of any student will result in his suspension by the Dean upon recommendation of the Dean's Council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for all courses in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in the computation of the quality-point index.

If a student suspended because of academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the quality-point index.

Honors

Lower Division Honor Roll.—The name of every lower division student who has a quality-point index of 3.50 or higher on the basis of his complete record at this University is placed on the honor roll and published. To be eligible, the student must have completed no less than 15 semester hours. (A place on the honor roll does not necessarily mean that the student will receive honors upon graduation.)

Dean's List.—The name of every student who makes a quality-point index of 3.50 or higher on a minimum of 15 semester hours of work taken in any one semester is placed on the Dean's List for that semester.

With distinction.—A Bachelor's degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded by the Faculty to the recipient of a Bachelor's degree for outstanding achievement in the major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101 and 102 with an academic standing among the upper third of the students enrolled therein; (2) has an accumulative academic average of *B* or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself by demonstrated leadership through participation in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" is authorized to wear a "Distinguished Cadet" badge above the right breast pocket of the uniform. He may submit an application for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate."

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been designated a "Distinguished Air Force ROTC Cadet" and maintained the standards required of a "Distinguished Air Force ROTC Cadet" during the period between designation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for a Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he made application, will be considered for a regular commission in the United States Air Force.

Probation

A student must maintain a quality-point index of at least 2.00, or be placed on probation. He remains on probation as long as his index is below 2.00 or until his probation is removed by the Committee on Scholarship. The student whose average is 2.00 or below for work undertaken during this probationary period is suspended. The student whose over-all quality-point index is still below 2.00 but whose average for work undertaken during the probationary period is above 2.00 may be continued on probation by the Committee on Scholarship.

Suspension

A student whose index falls below 1.50 or who is placed on probation for a third semester, whether successive or after an interval, is suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors file in the Office of the Dean the names of freshman and sophomore students who are doing work of *D* grade or lower. A notice of Warning is sent to the student and a copy filed with the appropriate adviser. A "warning" constitutes notice to the student that he must consult his instructor and adviser at the earliest opportunity.

The foregoing scholarship rules are applied to a student with a limited schedule only when he has undertaken a minimum of 15 semester hours.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Permission to withdraw from the Uni-

registry will not be granted a student who does not have a clear financial record. (See "Fees and Financial Regulations", pages 16–19.)

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

A student may not withdraw from either the basic course or the advanced course of the Air Force ROTC without the approval of the President of the University.

CHANGES IN PROGRAM OF STUDIES

Changes within a College, School, or Division.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the Dean.

Change from one section to another of the same course may be made with the approval of the Dean and the department concerned.

Change from one major subject to another within the same college or school may be made with the approval of the Dean. All requirements of the course of study to which the change is made must be met.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Except in cases of normal progression from the lower division of Columbian College in a regular baccalaureate program, application for transfer must be made to the Director of Admissions on the form provided by his office.

Students wishing to transfer from the Division of University Students to a degree-granting college or school of the University should note that a maximum of 45 semester hours will be accepted in transfer.

Students transferring within the University should note that in all undergraduate divisions, except the College of General Studies, 30 semester hours, including *at least 12 semester hours* in the major field, must be completed *in residence* in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill. (For residence requirements for the Associate's degrees in the lower division of Columbian College, see page 30.)

CREDIT

Credit is given only after registration for a course and satisfactory completion of the required work, or upon the assignment of advanced standing.

On request the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first copy; a fee of one dollar is charged

* The University work week is Monday through Friday, inclusive.

for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

Summer School Credit

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the dean of his college or school. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

Correspondence and Home-study Courses

No credit is given for work done by correspondence or in home-study courses.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirements, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return, unless during his absence he maintains "in residence" status by paying the residence fee, see page 16.

The student who has completed tuition requirements, but whose graduation is deferred for any reason must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

Application for Graduation.—Application should be filed in the Office of the Registrar at the time of registration for the last semester of the senior or final year. No applications will be accepted after the date stated in the calendar.

Graduate Record Examination.—All candidates for Bachelor's degrees are required to take two parts of the Graduate Record Examination (see page 30).

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Presence at Graduation.—Presence at the graduation exercises is required of the candidate, unless the work for the degree was completed during the summer term or written application for graduation *in absentia* has been approved by the Dean.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

CLASSIFICATION OF STUDENTS

A *freshman* is a student who is in the process of completing 32 semester hours, including 18 hours of his curriculum requirements.

A *sophomore* is a student who has completed between 32 and 64 hours, including 18 hours of his curriculum requirements.

A *junior* is a student who has completed between 64 and 94 hours and filed the declaration of his major, approved by his adviser, in the Office of the Dean.

A *senior* is a student who has completed between 94 and 124 hours, including at least 6 hours of second-group work in his major.

A *master in course* is a student who has satisfactorily completed the work for the bachelor's degree and filed his approved program of study in the Office of the Dean.

THE LOWER DIVISION

Advisory System

Members of the Faculty, selected for their knowledge of freshman-sophomore requirements and student programs, advise students in making up their programs of study for each semester. A separate staff of experienced advisers under the chairmanship of the Dean assists those students who find it difficult to make adjustments to college life because of scholastic or other reasons. Students who are "warned" or who are on probation may be required to consult these advisers at regular intervals. Students are encouraged to consult any member of the Advisory Staff or their instructors about college problems at any time.

Copies of notices of "warning" or probation are sent to the parents or guardians of students on request, and the Dean and members of the Advisory Staff or available for consultation with parents or guardians concerning student problems.

Preprofessional Students.—Preprofessional students who intend to transfer after the sophomore year to the School of Education; the School of Pharmacy; or the School of Government, Business, and International Affairs are registered in the lower division to complete the curriculum requirements specified by each professional school. Such students are assigned special advisers to assist them in planning their programs.

Scholastic-Aptitude Tests

Students admitted to the lower division of Columbian College may be required to take the scholastic-aptitude tests of the University.

Required Placement Examinations

English.—Special placement examinations, required of all entering freshmen, are conducted by the English Department. Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

Foreign Languages.—A standardized placement examination is required of all entering students who wish to continue in college the language begun in high school (French, German, Russian, or Spanish). Upon completion of the examination, assignment is made to the appropriate course.

First- and Second-Group Courses

A freshman or sophomore may not take second-group courses (courses numbered 101–200) without the written permission of the Instructor and of the Dean*. A student is not permitted to postpone a required first-group course in order to take a second-group course for elective credit. The principle that first-group courses must be taken in the freshman and sophomore years, and advanced courses in the junior and senior years in Columbian College and the professional schools, is rigidly adhered to in approving student programs. No freshman or sophomore on probation may take second-group courses without the written permission of the Committee on Scholarship.

THE DEGREES

REQUIREMENTS FOR THE DEGREES

Residence

The residence requirement for an Associate's degree is 15 hours.

Scholarship

A quality-point index of 2.00 is required.

Curriculum

The satisfactory completion of 64 semester hours is required, as outlined in one of the curricula described below.

Except for students intending to apply for the combined degrees of Bachelor of Arts and Doctor of Medicine or the degree of Bachelor of Science in Medical Technology, not more than 12 hours of professional courses may be included in the 124 hours required for the Bachelor's degrees in Columbian College. Lower-division students electing professional courses under this rule must obtain the approval of the Dean before registration.

Physical Education.—Freshmen and sophomores are required to take Physical

* Students enrolled in the two-year terminal curriculum in Accounting, the Medical Technologist curriculum, and the pre-Pharmacy curriculum may take those second-group courses which are specified as part of their freshman-sophomore curricula without first obtaining the written permission of the Instructor or the Dean.

Education 1–2 and 11–12 unless they are registered for less than 9 semester hours or unless regular employment during the day makes it necessary to take all classes during the evening hours. Air Force ROTC cadets and a limited number of freshman and sophomore women may substitute Air Science 1–2 and 11–12 for the physical education requirement.

Any other exemptions will be granted only upon written petition which has been recommended by the physical education department concerned and approved by the Dean.

Students exempt from the physical education requirement will be required to substitute four hours of elective.

A student entering the University with advanced standing is not exempt from the physical education requirement unless he has satisfactorily met the requirement elsewhere.

The required medical and physical examinations, as specified by the departments of physical education, will be arranged at the time of registration.

Foreign Language.—In curricula requiring foreign languages a student must complete satisfactorily the equivalent of two years of college work in a single foreign language.

A student offering for admission four acceptable high school units of a single foreign language, or the equivalent, is not required to take any foreign language.

A student who offers less than four units and wishes to meet the requirement by continuing in the same language must take the language placement test (see page 30).

In general, one year of high school language is considered equivalent to one semester of college language.

In some instances foreign languages are required or recommended as preparation for advanced work in Columbian College and the professional schools. The student should consult his adviser as to these requirements, so that appropriate foreign languages may be included, when necessary, in his lower division program.

English.—Entering students registered in the liberal arts and sciences curricula must follow the sequence of English 1 or 1X, both halves of one of the introductory literature courses, and English 4. This does not apply to students transferring to these curricula or students registering in the preprofessional or vocational curricula.

Examinations for Waiving Curriculum Requirements*

A required course may be waived and admission to an advanced course granted by the satisfactory passing of a waiver examination prescribed by the department concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Written request to take the examination should be made to the Dean and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

I. CURRICULA IN PREPARATION FOR THE UPPER DIVISION OF COLUMBIAN COLLEGE AND THE PROFESSIONAL SCHOOLS

Each of the following curricula comprises the first two years of a standard four-year college course and prepares the student for upper division work.

All curricula in this group lead to the degree of Associate in Arts.

*This provision does not apply to the premedical student, all of whose required premedical work must be taken in a recognized college of arts and sciences.

A. UPPER DIVISION OF COLUMBIAN COLLEGE:

1. ARTS AND LETTERS

The following curriculum constitutes the first two years of the Bachelor of Arts curriculum:

		Semester hours
English Composition and Literature	English 1 or 1X, 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52; English 4	12 12
Foreign Language	See page 31 for foreign language requirement	4
Physical Education	See pages 30–31 for statement of requirement	
Science	Biology 1–2*; Chemistry 3–4, 11–12; Geology 1–2; or Physics 11–12	6–8
Social Studies	Economics 1–2; Geography 51, 52; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10; or Sociology and Anthropology 1–2	6 3–4
Elective†		64
	Total	

2. SCIENCE

The following curriculum constitutes the first two years of the Bachelor of Science and the Bachelor of Science in Medical Technology curricula. Medical Technology students must include Biology 1–2*, Chemistry 11–12, and Microbiology 112:

English Composition and Literature	English 1 or 1X; 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52; English 4	12 12
Foreign Language	French, German, Russian, or nonscience elective NOTE.—A reading knowledge of French, German, or Russian is required. This may be satisfied by French 4, German 4, or Russian 4 or by special examination.	6
Mathematics	Mathematics 3, 6, or electives NOTE.—The Mathematics 3 requirement may be satisfied by offering two years of high school algebra, acceptable for admission; the Mathematics 6 requirement may be satisfied by offering one-half year of high school trigonometry acceptable for admission.	4 8
Physical Education	See pages 30–31 for statement of requirement	
Science	Biology 1–2* Chemistry 11–12, Geology 1–2, Physics 11 and 12 or 11 and 14	12–14
Social Studies	Economics 1–2; Geography 51, 52; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10; or Sociology and Anthropology 1–2	6 2–4
Elective†		64
	Total	

* An interdepartmental course offered by the departments of Botany and Zoology.

† It is suggested that electives include one of the following courses: Art 31–32, 71–72; Philosophy 51–52; Religion 9–10, 59–60.

Students enrolled in the Medical Technology program should elect Microbiology 112.

The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.

Credit is not given for courses elected in Secretarial Studies; credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

3. PREMEDICAL.

Premedical students may follow either the Arts and Letters or the Science curriculum above in fulfilling the first 60 semester hours of the premedical requirement. Each premedical program must be approved by the premedical adviser.

Well-qualified candidates are eligible for admission to the School of Medicine after completing 90 semester hours, or the equivalent, applicable toward a degree in an approved college. However, they are better prepared for the study of medicine after four years of college work. The Medical College Admission Test, sponsored by the Association of American Medical Colleges, must be taken in advance of the year for which application is made. Specific required courses are:

Chemistry:

Inorganic (including 4 hours of laboratory) Qualitative analysis may be counted as part of this requirement.	8
Organic (including laboratory) The equivalent of a one-year college course	6–8
Biology (including 4 hours of laboratory) A course in either general biology or zoology	8
Physics (including at least 2 hours of laboratory)	8
English Composition and Literature	6

Except for these requirements applicants are urged to follow personal interest in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

4. MEDICAL TECHNOLOGY

The degree of Bachelor of Science in Medical Technology is offered by Columbian College in collaboration with the Department of Pathology and the University Hospital. Candidates should follow the Science curriculum in the lower division, including specifically Biology 1–2*, Chemistry 11–12, and Microbiology 112. See pages 41 and 42 for a description of the course and a statement of further requirements. Specific degree requirements are stated under the Department of Pathology following the listing of the Staff of Instruction.

B. SCHOOL OF PHARMACY:

The following curriculum constitutes the first two years of the five-year Bachelor of Science in Pharmacy curriculum of the School of Pharmacy.

		Semester hours
English Composition and Literature	English 1 or 1X; 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52; English 4	12
Physical Education	See pages 30–31 for statement of requirement	4
Science	Chemistry 11–12, 151–52; Physics 11, 12; Biology 1–2*	30
Social Studies	Economics 1	3
Mathematics	Mathematics 3 or elective	3
Electives†		12
	Total	64

* An interdepartmental course offered by the departments of Botany and Zoology.
† Credit is not given for courses elected in Physical Education or Secretarial Studies.

C. SCHOOL OF EDUCATION:

1. EDUCATION

The following curriculum constitutes the first two years of the Bachelor of Arts in Education curriculum of the School of Education:

English	English 1 or 1X, 2	6
	English 51–52, 71–72, or 91–92	6
Foreign Language	(French, German, Latin, Russian, or Spanish.) See page 31 for foreign language requirement	12
Physical Education	See pages 30–31 for statement of requirement	4
Science	Three semesters (two in biological science and one in physical science or vice versa) to supplement senior high school courses in those fields and chosen from Biology 1–2*; Chemistry 3–4, 11–12; Geology 1–2; Physics 11, 12. (A student offering for admission two or more acceptable senior high school units in the above areas of science may be exempted from one semester of this requirement.)	10–12
Mathematics	One semester to supplement senior high school courses, chosen from Mathematics 3, 6, 9, 21	3
Social Studies	History 71–72; Political Science 1 and 9, 1 and 10, or 9–10	6
	Economics 1–2; Geography 51–52; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, 9–10; Religion 59–60; Sociology and Anthropology 1–2. (A student offering for admission two or more acceptable senior high school units in social studies may be exempted from this requirement.)	6
		3
		6
Speech	Speech 1 (or 11, if the Department so advises)	0–2
Psychology	Psychology 1, 22	6
Elective		6
	Total	64

2. HOME ECONOMICS†

The following curriculum constitutes the first two years of the Bachelor of Science in Home Economics curriculum of the School of Education:

English	English 1 or 1X, 2	6
	English 51–52, 71–72; Speech 1–2, or 1 and 11	6
Physical Education	See pages 30–31 for statement of requirement	4
Psychology	Psychology 1, 29	6
Science	Biology 1–2*, Chemistry 11–12, Physics 11, 12	6–8
Social Studies‡	Economics, History, Political Science, or Sociology and Anthropology	12
Major Prerequisites	Home Economics 1, 22 (Freshman year)	6
	Home Economics 51, 62 (Sophomore year)	9
Academic Electives	(Freshman year)	3
	(Sophomore year)	6
	Total	64

3. PHYSICAL EDUCATION FOR MEN

The following curriculum constitutes the first two years of the Bachelor of Science in Physical Education curriculum of the School of Education:

English	English 1 or 1X, 2	6
Science	Biology 1–2* (Freshman year)	8
	Chemistry 3–4 (Sophomore year)	8

* An interdepartmental course offered by the departments of Botany and Zoology.
† Open only to students enrolled in this curriculum as of September 1961 or earlier.
‡ Courses are to be selected with the approval of the adviser in the Department of Home Economics.

Social Studies	History 71–72; Political Science 1 and 9, 1 and 10, or 9–10	6
	Sociology and Anthropology 1–2	6
Major Prerequisites	Physical Education 41, 43–44, 47; Speech 1 or 11 (Freshman year)	10
	Physical Education 45–46, 49, 50, 58; Psychology 1, 22 (Sophomore year)	18
Elective		2–4
	Total	64

4. PHYSICAL EDUCATION FOR WOMEN

The following curriculum constitutes the first two years of the Bachelor of Science in Physical Education curriculum of the School of Education:

English	English 1 or 1X, 2	6
	English 51–52, 71–72, or 91–92	6
Physical Education	1–2, 11–12	4
Science	Biology 1–2* (Freshman year)	8
	Chemistry 3–4 (Sophomore year)	8
Social Studies	History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10; or Sociology and Anthropology 1–2	6
Major Prerequisites	Physical Education 43–44 (Freshman year)	4
	Physical Education 49, 50, 51–52; Psychology 1, 22 (Sophomore year)	16
Academic Electives		6
	Total	64

D. SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS:

1. ACCOUNTING AND BUSINESS ADMINISTRATION

The following curriculum constitutes the first two years of the Bachelor of Business Administration curricula in Accounting and in Business Administration of the School of Government, Business, and International Affairs:

Accounting	Accounting 1–2	6
English	English 1 or 1X, 2, 11	9
Foreign Language	See page 31 for foreign language requirement	12
Physical Education	See pages 30–31 for statement of requirement	4
Social Studies	Economics 1–2; Political Science 1 and 9, 1 and 10, or 9–10	12
Speech	Speech 1	3
Statistics	Statistics 51, 52	6
Electivet	(Students interested in Foreign Commerce include Geography 51)	12
	Total	64

2. INTERNATIONAL AFFAIRS AND PUBLIC AFFAIRS

The following curriculum constitutes the first two years of the Bachelor of Arts in Government curricula in International Affairs and Public Affairs of the School of Government, Business, and International Affairs:

English	English 1 or 1X, 2	6
Foreign Language	See page 31 for foreign language requirement	12
Mathematics, Science	Biology 1–2*, Chemistry, Geology, Mathematics, Physics, or Statistics	6 to 8

* An interdepartmental course offered by the departments of Botany and Zoology.
† Credit is not given for courses elected in Physical Education or Secretarial Studies.

Physical Education	See pages 30–31 for statement of requirement	4
Social Studies	Economics 1–2; History 39–40, 71–72; Political Science 1 and 9, 1 and 10, or 9–10	24
Elective*	(To satisfy minimum required credits. Students interested in Foreign Service include Geography 51)	10 to 12
	Total	64

3. BUSINESS AND ECONOMIC STATISTICS

The following curriculum constitutes the first two years of the Bachelor of Business Administration curriculum in the field of Business and Economic Statistics of the School of Government, Business, and International Affairs:

Accounting	Accounting 1–2	6
Economics	Economics 1–2	6
English	English 1 or 1X, 2	6
Foreign Language	See page 31 for foreign language requirement	12
Mathematics	Mathematics 21, 22, 23	9
Physical Education	See pages 30–31 for statement of requirement	4
Political Science	Political Science 9–10	6
or Philosophy	Philosophy 51–52	6
Statistics	Statistics 51 or 91, 52	9
Elective*		6
	Total	64

II. VOCATIONAL CURRICULA

In addition to the above curricula, the lower division offers the following two-year terminal courses.

The curricula in Accounting and Secretarial Studies lead to the degree of Associate in Arts. The curricula in Home Economics and Physical Sciences lead to the degree of Associate in Science.

1. ACCOUNTING

The required work may be completed in two calendar years on a full-time basis or in three calendar years on a part-time basis, with the approval of the adviser.

Accounting	Accounting 1–2, 101, 111, 121–22, 161, 171, 181, 191, 193	33
Business Administration	Business Administration 131, 161, 162	9
Economics	Economics 1–2	6
English	English 1 or 1X, 2	6
Physical Education	See pages 30–31 for statement of requirement	4
Elective	To be selected with the approval of the adviser	6
	Total	64

2. HOME ECONOMICS†

English	English 1 or 1X, 2	6
	English 51–52, 71–72, 91–92, Russian 91–92; Speech 2 (1, 11)	6
	English 11 or Secretarial Studies 51	3
Home Economics	Home Economics 1, 22, 51, 62	12
Physical Education	See pages 30–31 for statement of requirement	4
Psychology	Psychology 1	3
Secretarial Studies	Secretarial Studies 1, 2	6
Home Economics Elective‡		6–12
Elective*		6–12
	Total	64

* Credit is not given for courses elected in Physical Education or Secretarial Studies.
† Open only to students enrolled in this curriculum as of September 1961 or earlier.
‡ Courses are to be selected with the approval of the adviser in the Department of Home Economics.

3. PHYSICAL SCIENCES

This curriculum is designed for part-time students who do not wish to extend their collegiate education beyond 64 semester hours of work. All other students interested in the study of physical science should follow the Columbian College Science curriculum.

Chemistry	Chemistry 11, 12, 21	12
English	English 1 or 1X, 2, 11	9
Mathematics	Mathematics 3, 6, 21, 22, 23, 24	12–18
Mechanical Engineering	Mechanical Engineering 10	2
Physical Education	See pages 30–31 for statement of requirement	4
Physics	Physics 11, 12, 13, 16, 55	15
Elective	(Speech 1, Economics 1–2 suggested)	4–10
	Total	64

5. SECRETARIAL STUDIES

English	English 1 or 1X, 2	6
	English 51–52, 71–72, 91–92, Russian 91–92	6
Physical Education	See pages 30–31 for statement of requirement	4
Secretarial Studies*	Secretarial Studies 1, 2, 11, 12, 15, 16, 51, 54	24
Social Studies	Economics 1–2, Geography 51, 52, History 39–40, 71–72, Political Science 1 and 9, 1 and 10, or 9–10, or Sociology and Anthropology 1–2	6
Accounting	Accounting 1	3
Speech	Speech 11	3
Elective	To be selected with the approval of the adviser	12
	Total	64

UPPER DIVISION

A student with 64 or more acceptable semester hours, whether earned in this University or transferred from another institution, is registered in the upper division of Columbian College. It is assumed that he has met the requirements of the lower division *Arts and Letters* or *Science* curriculum. If he has not, he must begin to make up his deficiencies immediately upon admission and continue to carry courses to this end until all requirements are met.

THE BACHELOR'S DEGREES

Columbian College through its upper division offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Science in Medical Technology.

In cooperation with the School of Medicine a seven-year curriculum leading to the combined degrees of Bachelor of Arts and Doctor of Medicine is offered.

REQUIREMENTS FOR THE DEGREES

A minimum of 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the upper division of Columbian College. This requirement applies to students transferring within the University as well as to students transferring from other institutions.

* Qualified students, upon the approval of the adviser or the satisfactory completion of a placement test, may waive Secretarial Studies 1, 11, and 12. Other courses approved by the adviser will be substituted.

dents transferring from other institutions. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

For the regulation governing students who are absent from the University for one semester or more, see page 16.

Curriculum Requirements

The curriculum requirements for the Bachelor's degrees include at least 60 semester hours beyond those of the appropriate lower division curriculum and the satisfactory completion of the major. Each program must be approved by the major adviser and by the Dean.

At least 24 of the last 60 hours counted toward the Bachelor's degree must be taken in subjects* not included in the major field or department. The student should consult his major adviser at each registration concerning his choice of electives.

Except for premedical and medical technology students, not more than 12 hours of professional courses may be included in the undergraduate program. The election of professional courses must be approved by the Dean's Council prior to registration. Ordinarily courses in Physical Education, Secretarial Studies, and technical courses in Education will not be approved toward a degree.

A change in degree candidacy (e.g., from Bachelor of Arts to Bachelor of Science) requires the permission of the Dean. The degree requirements effective at the time the change is approved must be met.

Each student must select and file with the Dean a choice of major upon entering the upper division. He may change the major only with the consent of the Dean and of the department or committee concerned, and must meet the requirements for the new major which are in effect at the time the change is approved.

First-group courses may be required as prerequisites to the major, but because of their introductory character they may not be counted as part of such programs. (See "Explanation of Course Numbers.")

Students transferring from other institutions or from other schools, colleges, or divisions in this University with major requirements wholly or substantially met must complete satisfactorily at least 12 semester hours of approved work in the major field in the upper division of Columbian College. This work will count as part of the minimum residence requirement.

Examination for Waiving Curriculum Requirements.—A required course may be waived and admission to an advanced course granted by the satisfactory passing of a waiver examination prescribed by the department concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Written request to take the examination should be made to the Dean and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

Independent Study Plan

A junior or senior of demonstrated capacity, with special interest in the subject matter of a course, may be permitted to undertake independent study under the personal direction of an instructor, in accordance with the rules of the department or

* Art, Biology, Botany, Chemistry, Classical Languages and Literatures, Economics, English, Geography, Geology, Germanic Languages and Literatures, History, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Religion, Romance Languages and Literatures, Slavic Languages and Literatures, Sociology and Anthropology, Speech, Statistics, Zoology

departments concerned. Credit under this plan is limited to the specific course-credits as designated in the list of courses of instruction.

Graduate Record Examinations

During the final semester of the senior year students in Columbian College are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities.

The examinations are conducted by the University twice a year: the Fall Testing Session for seniors graduating in February, and the Spring Session for those graduating in June. Dates of the examinations are announced in the *Schedule of Classes*.

Each senior must register for the Graduate Record Examination when he registers for his final regular semester of study (excluding summer sessions). A $10 examination fee is payable at the time of registration.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

BACHELOR OF ARTS

The work of the junior and senior years, including a major in one of the following fields must be approved by the major adviser and by the Dean.

Major Fields.—American Thought and Civilization; Art (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, and (4) Commercial Art; Biology; Botany; Chemistry; Economics; English Literature; French Language and Literature; Geography; Geology; Germanic Languages and Literatures; History; Journalism; Latin; Latin American Civilization; Mathematical Statistics; Mathematics; Philosophy; Physics; Political Science; Psychology; Religion; Russian; Sociology and Anthropology; Spanish American Literature; Spanish Language and Literature; Speech (Speech or Dramatic Art); Zoology.

Combined Degrees of Bachelor of Arts and Doctor of Medicine.—A candidate for the combined degrees of Bachelor of Arts and Doctor of Medicine must: (1) complete the Medical School entrance requirements; (2) fulfill the Arts and Letters curriculum of the lower division requirements (see page 32); (3) accumulate 94 semester hours in the liberal arts, including a minimum of 30 in the upper division of Columbian College; (4) obtain the approval of the Dean of Columbian College at the time of entering the School of Medicine; (5) obtain the recommendation of the Dean of the School of Medicine at the completion of all prescribed courses in the first year of the School of Medicine, at which time the degree of Bachelor of Arts will be conferred (professional work taken at another institution will not satisfy the major requirement for the combined degrees); (6) maintain throughout the entire course the scholarship level required for graduation.

BACHELOR OF SCIENCE

The work of the junior and senior years, including a major in one of the following sciences, must be approved by the major department or division and by the Dean.

Biological Sciences: Biology, Botany, Zoology. *Physical Sciences:* Chemistry, Geology, Mathematical Statistics, Mathematics, Physics.

THE UNDERGRADUATE MAJOR

There are two types of undergraduate majors: the field-of-study major and the departmental major.

The Field-of-Study Major

Each Field-of-Study Major covers a carefully worked out field of coordinated study and is under the supervision of the appropriate department and the Columbian College Committee on Studies.

The *Field-of-Study Major* requires no specific number of semester hours, no specific program of courses, and no specific quality-point index for the major, although the student is required to meet the over-all general requirements for the degree (at least 124 semester hours with a quality-point index of at least 2.00). Ability to pass the Major Examination is assumed to be a convincing demonstration that the student possesses the breadth, depth, and quality of knowledge of his major usually defined in terms of semester hours, courses, grades, and a better-than-average quality-point index. A pamphlet on each field is obtainable either from the appropriate adviser or from the Office of the Dean. The prospective student should place himself under the direction of the appropriate adviser immediately upon completing lower division work and beginning his junior year.

The Field-of-Study Major places special emphasis on the intellectual development of the individual student. Programs in the same major may vary, depending upon the individual student's background, previous study, reading habits, and aptitudes. The student is expected to consult his adviser frequently, and the special proseminar offered in the field gives him further opportunity for individual advice and direction in pursuing a program especially adapted to his needs and abilities. A close student-adviser relationship is essential for the student's success under the Field-of-Study Major plan.

The following Field-of-Study Majors are offered: American Thought and Civilization, English Literature, French Language and Literature, History, Latin American Civilization, Mathematical Statistics, Philosophy, Spanish American Literature, Spanish Language and Literature, Zoology.

The major in American Thought and Civilization and in Latin American Civilization involve studies in two areas, those of Languages and Literatures and of Social Sciences. The other Field-of-Study Majors, with the exception of the major in Spanish American Literature, replace departmental majors in their respective fields. A candidate for a Bachelor's degree with a major in English Literature, French Language and Literature, History, Mathematical Statistics, Philosophy, Spanish American Literature, Spanish Language and Literature, or Zoology must elect a Field-of-Study Major.

Proseminar in the Major

A proseminar is offered in each field to help the student in his reading, study, and laboratory exercises acquire a coordinated knowledge of his field. It is a presentation of the content and methods of the major field as a whole through the organization and coordination of the knowledge obtained in the various formal courses in the major subject and of material not usually included in such courses. This course is not required. Six semester hours, but no qualitative grade, may be assigned. When registered in this course, the student has the privilege of visiting, subject to the ap-

proval of the instructor, any other appropriate course offered in the College. (Regular attendance in a course, either for credit or as an auditor, requires registration and payment of tuition.) Proseminars are open only to the student who has been accepted as a candidate under that specific major.

The Major Examination

The Major Examination will normally be taken at the close of the senior year: a student on a limited schedule may take it no earlier than one calendar year before graduation. A student who fails to pass a Major Examination may, at the discretion of the Committee on Studies, be reexamined at a later regular major-examination period. The Committee on Studies has general supervision of the preparation, reading, and grading of Major Examinations. Major Examinations are held each semester on dates fixed by the department or departments concerned, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session.

Departmental Majors

Departmental Majors, unlike Field-of-Study Majors, are defined in terms of credit hours, required courses, and the attainment of a quality-point index of at least 2.50 in all second-group courses taken in the major field. The minimum specific requirements for Departmental Majors are listed below the staff of instruction of the department concerned. The Chairman of the Department, or designated departmental adviser, should be consulted at registration concerning the student's program of courses; and the entire program, including electives, must be approved by the Department. The student is also expected to consult the Chairman or adviser in all matters affecting his program of studies, such as changes, substitutions, or withdrawals, and especially concerning his progress in his courses. As far as possible the close student-adviser relationship developed in the Field-of-Study Major will be cultivated also in Departmental Majors.

Departmental Majors are offered in the following: Art (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, and (4) Commercial Art; Biology; Botany; Chemistry; Economics; Geography; Geology; Germanic Languages and Literatures; Journalism; Latin; Mathematics; Physics; Political Science; Psychology; Religion; Russian; Sociology and Anthropology; Speech (Speech or Dramatic Art).

BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

In cooperation with the University Hospital and the Department of Pathology of the School of Medicine, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

A candidate for this degree must complete the Science curriculum in the lower division, including Biology 1–2*, Chemistry 11–12, 21, and 22; and Microbiology 112; fulfill the Columbian College requirements for degrees, including the residence requirement of at least 30 semester hours; complete the 12-month Medical Technology Course in the University Hospital (see the Department of Pathology), which constitutes the major and prepares students for the national certifying examination given by the Registry of Medical Technologists; and maintains throughout the entire course the scholarship level required for graduation.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. (See page 22.) All stu-

* An interdepartmental course offered by the departments of Botany and Zoology

dents in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital. A cash allowance of $65 a month is granted during the last 6 months of the fourth year in training.

Admission to the Columbian College degree program does not assure acceptance in the Hospital program.

For information concerning the Medical Technology Course for students not interested in degree candidacy, see the special bulletin.

THE GRADUATE DIVISION

The graduate division offers programs leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

Definition of the Master's Work

The study leading to a Master's degree is a comprehensive survey of an area of knowledge, usually in the student's undergraduate field, with emphasis on scholarly method.

The student must satisfy certain minimum requirements as to preparation, residence, ability to read an approved modern foreign (European) language, and courses taken; but these requirements, while essential, are regarded primarily as qualifying measures. The student's knowledge of his field, as demonstrated by his thesis and by the results of his Master's Examination (together with such other examination involving special skills or techniques as the department or the Committee on Studies may require), is the basis upon which the Master's degree is conferred.

Master of Arts

Graduate work leading to the degree of Master of Arts is offered in the following fields:

American Literary and Cultural History, Art History and Criticism, Biochemistry, Biology, Botany, Chemistry, Economics, English and American Literature, English Literature, French Language and Literature, Geography, Geology, Germanic Languages and Literatures, History, Latin American Civilization, Mathematical Statistics, Mathematics, Microbiology, Pharmacology, Philosophy, Physics, Physiology, Political Science, Psychology, Religion, Religious Education, Sociology and Anthropology, Spanish American Literature, Spanish Language and Literature, Speech Correction, Zoology.

Special programs involving coordinated work in two or more departments may be arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

Master of Science

Graduate work leading to the degree of Master of Science is offered in the following fields:

Anatomy, Biochemistry, Biology, Botany, Chemistry, Geology, Mathematical Statistics, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology, Zoology.

Special programs involving coordinated work in two or more departments may be

arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

Master of Fine Arts

Graduate work is offered leading to the degree of Master of Fine Arts in the fields of painting and sculpture (see the Department of Art) and in the field of Dramatic Art (see the Department of Speech).

REQUIREMENTS FOR THE DEGREES

Residence

Normally, an academic year of residence in the graduate division of Columbian College is required, i.e., completion of a minimum of 30 semester hours of work including the thesis, which is counted as the equivalent of 6 semester hours of course work. Summer work may be counted in residence, but in no case may the period of residence aggregate less than twenty-seven weeks. Not more than 12 semester hours (which must be approved in advance by the Dean) may be taken in another school or division of this University, and such work may not be counted toward both a degree in that school or division and the Master's degree in Columbian College. *No part of the minimum requirement may be taken elsewhere.* All work for the degree of Master of Arts, Master of Science, or Master of Fine Arts must be completed within a maximum of three years, unless the Dean's Council considers the circumstances so unusual as to justify an extension of time.

Scholarship

Grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete).

The grade of *E* must be attained in at least 6 semester hours of the course requirements for the degree.

A student whose scholarship is unsatisfactory may be suspended by the Dean upon recommendation of the department under which the student is working. A Master's candidate who accumulates 9 hours of more of *U* (including grades of *C* or lower in prerequisite courses) will be automatically suspended.

Program of Studies

The student's program of studies must be outlined in detail at the beginning of his work, in triplicate, on forms available at the Office of the Dean. Each program is subject to the approval of the department and the appropriate member of the Committee on Studies. The program may be revised, but any change necessitates a repetition of the procedures just described.

The candidate for the Master's degree ordinarily may specialize exclusively in the field of his choice. Any student, however, whose undergraduate training does not include at least one full year of work in each of the following areas of study: (1) mathematics or science (with or without laboratory), (2) social science, and (3) the humanities (literature, philosophy, art, music, or religion), must make up this deficiency in his general education before being admitted to candidacy for the Master of Arts degree. This last provision does not apply to candidates for the Master of Science degree.

Courses numbered from 1 to 100 may not be credited toward the Master's degrees, but may in certain instances be required as a basis for advanced work. At least 6

semester hours of the course work required for the degree must be taken in courses numbered over 200. Courses numbered between 100 and 200 may be credited toward the degree, if completion of additional work has been certified by the appropriate officer of instruction. (See "Explanation of Course Numbers".)

A student who expects to continue his studies for the degree of Doctor of Philosophy after receiving the Master's degree is strongly advised to plan his program from the beginning so that work for the lower degree will constitute the initial stage of the doctoral discipline and, upon completion, will admit him to full status in the Graduate Council.

Foreign Language Requirement

Before being admitted to candidacy the student must show that he has a reading knowledge (certified by the appropriate foreign-language department) of at least one foreign language, selected by the department or committee under which he is studying. A student whose field is a modern foreign language or literature may not offer that language in satisfaction of the reading-knowledge requirement. Any candidate who chooses to meet the language requirement in French, German, or Spanish and has not passed the language examination by the end of 15 attempted semester hours must register for French 49, German 49, or Spanish 49 as part of his next registration. The Master's reading examination is given at the first and last class meeting of each of these courses and on the last Saturday of the summer term. No student will be permitted to take the examination after three unsuccessful attempts. Those enrolled in French 49, German 49, or Spanish 49 who pass the first examination are excused from the course and will receive a refund of tuition. Students who expect to take a reading examination in any approved language other than French, Spanish, or German should notify the Dean at the time of registration.

Students are reminded of the necessity for early satisfaction of this requirement, normally not later than the end of the first semester of registration for the degree.

Admission to Candidacy

A student must be admitted to candidacy before he begins the last half of his work for the Master's degree, i.e., not later than the completion of 15 semester hours of degree courses. Application for admission to candidacy is made on a form obtained at the Office of the Dean, and must be approved by the appropriate representative of the department or committee and by the Dean. If a prospective candidate, in his previous academic work, has not substantially satisfied the prerequisites for the Master's degree, including the undergraduate major as defined by the appropriate department or committee, he will not be admitted to candidacy until such deficiency has been made up. He may make up his deficiencies by electing appropriate courses in addition to those counted toward his degree.

The Thesis

The thesis may be of a research, expository, critical, or creative type. The main purpose of a Master's thesis is to demonstrate the student's ability to make independent use of the information and training acquired through his other disciplines, and to furnish objective evidence of his constructive powers in his chosen field. Registration for the thesis must be no later than the beginning of the final year of preparation, unless the professor in charge of the thesis permits registration at the

beginning of the final semester. The choice of the thesis subject must be approved by the professor in charge of the student's field and filed in the Office of the Dean by the date announced in the University calendar. Registration for the thesis is ordinarily made on the basis of 3 hours for each of two successive semesters. In exceptional cases, and with the approval of the professor in charge of the thesis, the student may register for the entire 6 hours during a single semester. The thesis in its final form must be presented to the Dean, no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period the student must register for it again, and pay tuition on the same basis as for a repeated course.

The Master's Examination

In addition to such other examinations as may be required, the candidate must pass a general written examination on the major subject. Examinations are held on dates fixed by the department or committee, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session. A candidate who fails to pass the Master's Examination may, in exceptional circumstances and with the specific approval of the Committee on Studies, repeat the examination, but only after the lapse of one semester. If he fails a second time, no further opportunity to take the examination will be permitted.

VETERANS EDUCATION

The George Washington University is approved to provide training for those who are eligible under the provisions of Public Laws 634, 190, 550, 16 and 894. The Office of Veterans Education, Building Q, 2029 H Street, NW., operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office concerning the procedure for securing educational benefits before applying to the Veterans Administration for certification.

AIR FORCE RESERVE OFFICERS' TRAINING CORPS

The mission of the Air Force ROTC is to develop in selected students through classroom instruction and leadership training, the qualities essential for advancement to responsible positions as commissioned officers in the United States Air Force.

Course of Study

The program is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

Since many of the academic subjects in which college students are enrolled have a direct relationship to military as well as to civilian careers, some of the liberal arts courses of the University have been substituted for academic courses included in standard Air Force ROTC curricula. Courses have been carefully selected to avoid duplication in instruction and to provide practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral or written expression, and the techniques of problem solving are emphasized throughout the course, both in theory and practice. In addition, orientation flights and field trips to Air Force bases are available to cadets on a voluntary basis.

Twelve semester hours of elective credit* are granted Air Science students as follows:

Freshman year: fall semester, 1 hour; spring semester, 3 hours
Sophomore year: fall semester, 3 hours; spring semester, 1 hour
Junior and senior years: each semester, 1 hour

In the four-year program 16 semester hours of credit for courses offered by other colleges and schools of the University may be substituted for Air Science courses. For a description of Air Science courses, see pages 145–46.

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately $500, which is exempt from income tax. During the period of summer training, cadets receive $75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet.

Eligibility Requirements

Enrollment in the Division of Air Science basic course is open to all men students who are at least 14 years of age, physically fit, of good character, and candidates for Bachelor's degrees. Men enrolling in the basic course are required to complete successfully the two-year course as a prerequisite to graduation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

Women students may enroll in the Basic Leadership Laboratory course, which satisfies the physical education requirement. They may also enroll in the academic portion of the basic course for elective credit, with the approval of the Director of Air Science and the Dean.

A cadet enrolled in the advanced course must successfully complete the junior- and senior-year Air Science curricula and summer training unit as a prerequisite to graduation. Upon graduation he is obligated to accept a commission in the United States Air Force, if tendered. Any cadet who for academic, physical, or other rea-

* The amount of elective credit applicable toward a degree varies with the curriculum concerned

ions becomes disqualified for a commission is relieved of this obligation. Cadets preparing for pilot training may be required to take 35 hours of flying instruction. This instruction is provided by a Civil Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

Both men and women may enroll in Advanced Air Science courses with the approval of the Director of Air Science and the Dean.

Military Service Delay

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer sessions and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

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* A charge for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

† See Rule (5) for exception.

THE READING CLINIC

The Reading Clinic, 2018 I Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition special reading improvement classes are conducted on the high school and adult level.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is $35; for individual instruction, $5 a lesson; for semi-individual instruction, $4 a lesson; for instruction in small groups with common reading difficulties, $3.25 a lesson. All fees are payable in advance at the Office of the Cashier.

THE TESTING AND COUNSELING CENTER

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

The Center provides special testing services including: diagnostic tests prescribed by the School of Engineering, admissions tests for the University and for other educational institutions, and tests for business and industry.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is $7.50; for students currently enrolled in the University but not as degree candidates, the fee is $30; for graduates of the University, $30; for community clients, $45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains six residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Rooms are leased for the academic year, and a deposit of $50, which is credited toward the fall semester room charge, is required. If notice of withdrawal or cancellation of room reservation is received prior to June 30, $25 of the deposit will be refunded. Room rentals are payable in advance by the semester.

Forms for applications, together with detailed information, may be obtained from the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the residence halls only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to live outside the residence halls except with persons approved by the Director of Activities for Women.

Freshman girls may live outside the residence halls only with their parents or with immediate relatives with the written approval of their parents.

John Quincy Adams Residence Hall for men provides triple rooms with bath. Rooms rent at $345 a person for the academic year.

John C. Calhoun Residence Hall for men provides double rooms at $380 a person for the academic year.

William H. Crawford Residence Hall for women provides double rooms at $405 a person for the academic year.

Dolly Madison Residence Hall for women provides double rooms at $405 a person for the academic year.

Hattie M. Strong Residence Hall for women provides single rooms at $470 and double rooms at $405 a person for the academic year.

Welling Residence Hall for men provides double rooms at $300 a person for the academic year.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

University Chapel

The University Chapel is maintained as a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling and conference.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers outstanding employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting offices. The services of the Counseling Center are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

INTERNATIONAL HOUSE

International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

STUDENT ACTIVITIES

Directors of Student Activities

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all nonacademic phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

Student Government

Student Council

The University believes in encouraging the development of a sense of civic responsibility in its students by delegating to them such authority in student activities as is consistent with established policy and regulations. To this end, the organization of the University includes the Student Council, which, under the guidance of the Directors of Student Activities, is responsible for the conduct of all student activities. The Student Council is elected annually by the student body.

Committee on Student Life

The Committee on Student Life has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee. This Com-

mittee is given authority to approve or disapprove the establishment of any proposed organization on campus.

Eligibility for Student Activities

Any student registered in the University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee, Adams Hall Council, Calhoun Hall Council, Crawford Hall Council, Madison Hall Council, Strong Hall Council, Welling Hall Council, or any publications staff.
2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

The control and administration of all student activities are outlined in a separate bulletin called "Rules and Regulations Governing Student Activities."

Sports

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Intersorority Athletic Board cooperate with the department of Physical Education in conducting the women's intramural and interextra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

Other sports activities are included in the Sailing Association and the Rowing Club.

Arts

Students may participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III (Modern Dance) and Folk Dance; Enosinian Debate Society; University Players; University Glee Club; and University Orchestra. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

Annual Events

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is

the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion in Life Week.—Observed during the week of Thanksgiving. Religion in Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion in Life Week is sponsored by the University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree, the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions explore annually with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members.

The Colonial Cruise.—An afternoon and evening cruise on the Potomac in the late spring. Students, alumni, and faculty picnic, dance, and engage in games and athletic contests.

STUDENT ORGANIZATIONS

Honor Societies

Phi Beta Kappa.—A national honor society recognizing "outstanding intellectual capacity well employed" in the field of liberal arts and sciences. Senior and junior students who are candidates for the degree of Bachelor of Arts or Bachelor of Science in Columbian College and who have shown broad cultural interests, distinguished scholarly achievement, high character, general promise, and scholarly ideals may, to a number not exceeding 15 per cent of a class, be elected to membership by the Faculty members of the Alpha Chapter of the District of Columbia.

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Aesculapian Society.—An honorary premedical fraternity.

Alpha Kappa Delta.—A national sociology society.

Alpha Lambda Delta.—A national fraternity established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman women who attain a scholastic average of at least 3.50.

Arnold Air Society.—A national Air Force ROTC society for advanced cadets.

Delphi.—An intersorority society.

Delta Sigma Rho.—A national forensic society.

Gate and Key.—An intrafraternity society.

Iota Sigma Pi.—A national chemical society for women.

Mortar Board.—A national society for senior college women, stressing leadership, scholarship, and service.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Pershing Rifles.—A national Air Force ROTC society for basic cadets.

Phi Epsilon Phi.—A national botany fraternity.
Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.
Phi Sigma Tau.—A national philosophy honor society.
Pi Delta Epsilon.—A national collegiate journalism fraternity.
Pi Epsilon Delta.—A national drama honorary fraternity.
Pi Gamma Mu.—A national social-science society.
Psi Chi.—A national psychology fraternity.
Sigma Alpha Eta.—A national speech and hearing fraternity.
Sigma Pi Sigma.—A national physics fraternity.
Tassels.—A service honorary society for sophomore women.

Professional Organizations and Departmental Clubs

Alpha Chi Sigma (chemistry), Alpha Kappa Psi (commerce and economics), Chemistry Club, El Club Español, Enosinian Debating Society, Le Cercle Français, Lester F. Ward Sociological Society, Phi Delta Gamma (graduate), Phi Sigma Tau (philosophy), Russian Club, Sigma Delta Pi (Spanish).

Social Fraternities

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Sigma Delta, Sigma Nu, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta.

Social Sororities

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi, Sigma Delta Tau.

Religious Organizations

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

Student Publications

The Cherry Tree (the annual), *The University Hatchet* (weekly newspaper), *The Potomac* (literary magazine), *The Student Handbook*.

Other Organizations

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Calhoun Hall Council, Cheerleaders, Colonial Boosters, Democratic Club, Flying Sponsors, Foggy Bottom Sports Car Club, Interfraternity Council, Interlaw Fraternity Council, International Relations Club, International Students' Society, Inter-sorority Athletic Board, Junior Panhellenic Association, Madison Hall Council, Old Men, Republican Club, Senior Panhellenic Association, Strong Hall Council, Student Council, Students for Better Government (Political Party), Student Legal Aid Society, Station WRGW, University Pep Band, Wandering Greeks, Welling Hall Council, Writers' Club.

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the University in the liberal arts and sciences in the summer of 1962 and in the academic year 1962–63. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

HOURS OF INSTRUCTION

Classes are scheduled in the morning, afternoon, and evening. Evening and daytime sections of the same course are identical, are taught by the same staff of instructors, and carry the same amount of credit.

EXPLANATION OF COURSE NUMBERS

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the Dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the instructor, and when the completion of additional work has been certified by the instructor.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the instructor to qualified seniors; they are not open to other undergraduates.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3–3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ANATOMY*

Professors I. R. Telford *(Chairman)*, Paul Calabrisi
Professorial Lecturer T. D. Stewart
Associate Professors F. D. Allan, T. N. Johnson
Assistant Professors J. B. Christensen, J. C. Bartone
Clinical Instructors R. N. Brown, L. E. Church, L. C. Dearden

Special Lecturer B. S. Blumberg

Master of Science in the field of Anatomy.—Prerequisite: a Bachelor of Arts or Bachelor of Science degree from this University, or the equivalent, with a major in Biology.

* The Staff of Instruction here listed is for the academic year 1961–62.

Chemistry, or Zoology. The undergraduate program must include the following courses, or the equivalent: Biology 1–2*, Chemistry 11–12, 21, 151–52; Physics 11, 12; Zoology 103–4 (formerly 41–42). **Biochemistry 221–22 is recommended as an elective.**

Required: the general requirements, pages 43–45, including Anatomy 203, 204, 205, 221–22, 295–96, 299–300, and graduate courses in biochemistry, physiology, or related fields selected with the approval of the Department. It is not always possible to arrange courses and research so that the student can be assured of completing all the required work in one academic year.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

201–2 *Gross Anatomy* (8–2) **Calabrisi and Staff**

Academic year—as arranged. For qualified nonmedical graduate students. Same as Anatomy 101–2. Anatomy 201—laboratory fee, $21; Anatomy 202—laboratory fee, $16.

203 *Human Embryology* (2) **Allan and Staff**

Spring—as arranged. For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, $8.

204 *Neuroanatomy* (3) **Johnson and Staff**

Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, $13.

205 *Microscopic Anatomy* (4) **Telford and Staff**

Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, $13.

221–22 *Seminar* (1–1) **Telford and Staff**

Academic year: 1 hour a week—as arranged. Research reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.

249–50 *Introduction to Medical Research*† (3–3) **The Staff**

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

295–96 *Research* (arr.) **The Staff**

Academic year—as arranged. Fee to be arranged.

299–300 *Thesis* (3–3) **The Staff**

ART‡

Professors D. C. Kline *(Chairman)*, W. A. MacDonald
Associate Professor L. P. Leite
Associate Professorial Lecturer Grace Evans
Assistant Professor George Steiner
Studio Lecturers on the Staff of the Corcoran School of Art Edmund Archer, Richard Lahey, Jessalee Sickman, Heinz Warneke, C. E. Forsythe, Kenneth Hine, Harry Gates, Jack Perlmutter, Alexander Russo

Bachelor of Arts with a major in (1) *Art History and Theory*, (2) *Drawing and Painting*, (3) *Sculpture*, or (4) *Commercial Art (Departmental)*:

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.
† Also an interdepartmental course. The student should register in the department directing his research.
‡ The Staff of Instruction here listed is for the academic year 1961–62.

The major in Art History and Theory.—Prerequisite: the Arts and Letters curriculum, page 32, or the equivalent, including Art 31–32 and 71–72.

Required: in addition to the general requirements, pages 37–42, eighteen semester hours, as follows: Art 101 or 102, 103, 104 or 105, 110, 112, 113 or 114; and twelve semester hours selected from second-group courses, or from third-group courses open to undergraduates with the approval of the instructor. Students intending to major in this field are urged to acquire a reading knowledge of a foreign language, preferably French or German, at the earliest possible convenience.

The major in Drawing and Painting, Sculpture, or *Commercial Art.*—Prerequisite: the Arts and Letters curriculum, page 32, or the equivalent, including Art 21–22, 41–42, and 31–32 or 71–72.

Required: in addition to the general requirements, pages 37–42, twenty-four semester hours of studio practice; six semester hours of art history selected from second-group courses or from third-group courses open to undergraduates with the approval of the instructor.

Classes in the practice of art are held at the Corcoran School of Art.

Bachelor of Arts in Education with a teaching field in Art (School of Education).—Prerequisite: the Education curriculum, page 34.

Required: the Art option and professional courses listed in the School of Education Catalogue.

Master of Arts in the field of Art History and Criticism with concentrations in Classical Art and Archeology, Art of the Americas, Renaissance and Baroque Art, and Contemporary Art.—Prerequisite: the degree of Bachelor of Arts with a major in Art History and Theory at this University, or the equivalent.

Required: the general requirements, pages 43–45. As much as possible of the twenty-four semester hours in course work should be in third-group courses. A general written examination on the problems in the field of Art History and Criticism; a written thesis embodying the results of research on some specific topic in the history and criticism of art.

Master of Fine Arts in the field of Painting or *of Sculpture.*—Prerequisite: the degree of Bachelor of Arts with a major in Drawing and Painting, Sculpture, or Commercial Art at this University, or the equivalent.

Required: the general requirements, pages 43–45. As much as possible of the twenty-four semester hours in course work should be in third-group courses. A creative thesis in painting or sculpture; a paper discussing some technical phase of the problem illustrated by the thesis.

ART HISTORY AND THEORY

First Group

1 *Art Appreciation* (3) MacDonald

Fall—day; spring—day; summer 1962. A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and the ideas in art through the ages. (Primarily for nonmajors.)

31–32 *Survey of Western Art* (3–3) Leite

Academic year—day. A survey of the arts in the Western World from prehistoric to modern times. A foundation for further study in the history of art.

71–72 *Introduction to the Arts in America* (3–3) Kline

Academic year—evening; summer 1962—Art 71 (3). Painting, sculpture, and architecture of America, with selected references to the crafts and popular arts. *First half:* from Colonial beginnings to the Republican Age. *Second half:* from early 19th centruy to the present.

101 *Greek and Roman Architecture* (3) MacDonald

Fall—day.

102 *Greek and Roman Sculpture* (3) MacDonald

Spring—day.

103 *Medieval Art* (3) (Formerly Art 102) Evans

Fall—day. A study of architecture, sculpture, and painting from the formative states of Christian Art in the Byzantine Age through the Romanesque and Gothic periods.

104 *Renaissance Art in Italy I* (3) Leite
Fall—day. The early developments from the 13th to the 15th century.

105 *Renaissance Art in Italy II* (3) Leite
Spring—day. The High Renaissance and Mannerism.

106 *Renaissance Art in the North* (3) Leite
Summer 1962. A study of the painting in the Netherlands, Germany, France, Spain, and Portugal.

107 *Eighteenth Century Art in Europe* (3) Evans
Spring—day. The development of painting, sculpture, and architecture in 18th century Europe.

109 *Nineteenth Century Art in Europe* (3) Leite
Fall—day. Painting and sculpture from Academism to Symbolism.

110 *Contemporary Art* (3) Leite
Spring—day; summer 1962. Painting and sculpture in 20th century Europe.

111 *Classical Archeology* (3) MacDonald
Not offered 1962–63. A study of archeological monuments of classical civilizations, with intensive study of one or more areas selected from architecture, sculpture, painting, or minor arts.

112 *Art of Egypt and the Ancient Orient* (3) MacDonald
Spring—day. A study of the art of Mesopotamia, Anatolia, Egypt, and Persia.

113 *Baroque Art in Italy* (3) Leite
Fall—day. The development of painting, sculpture, and architecture in the 16th and 17th centuries in Italy.

114 *Baroque Art in the North* (3)
Not offered 1962–63. The development of painting, sculpture, and architecture in the 16th and 17 centuries in Holland, Flanders, Spain, France, Germany, and England.

115 *Christian Iconography* (3) (Formerly Art 210) Leite
Not offered 1962–63. The origins and development of Christian symbols and themes from Early Christian to modern times.

116 *Classical Iconography* (3) (Formerly Art 211) MacDonald
Not offered 1962–63. The origin and development of myths in classical art.

120 *Art of China and Japan* (3) (Formerly Art 204) Kline
Fall—day. The architecture, painting, and sculpture of China, Korea, and Japan.

141 *Interior Decoration* (3) Kline
Fall—day. A study of the principles of decoration dealing with furniture designs and ensemble layout, draperies, color, accessories, and lighting.

142 *House Planning* (3) Kline
Spring—day. Study of the contemporary house for family living, including site problems, the case plan, materials of building, and climate conditioning.

143 *Folk Arts in America* (3) Kline
Not offered 1962–63. Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts; selected references to American folk music.

Third Group

505 *Primitive Art** (3) Kline
Summer 1962. The arts of prehistoric and primitive man in Europe in the pre-Columbian Americas, Oceania, and Africa.

* May be taken for undergraduate credit with the approval of the instructor

207 *Modern Architecture* (3) Kline
Spring—day. The development of modern architecture and building technology in Europe and America from the late 19th century to the present.

243 *Seminar in American Art* (3) Kline
Not offered 1962–63.

244 *Seminar in Naturalism and Realism* (3) Leite
Not offered 1962–63. A reading knowledge of French is desirable.

245 *Seminar in Romanticism* (3) Leite
Not offered 1962–63. A reading knowledge of French and German is desirable.

246 *Seminar in Classical Art* (3) MacDonald
Fall—day.

247 *Seminar in Symbolism* (3) Leite
1962–63 and every third year: spring—day.

248 *Studies in Classical Art* (3) MacDonald
Summer 1962.

261–62 *Theory and Criticism* (3–3) (Formerly Art 161–62) MacDonald
Academic year—evening. The history of theory and criticism in Classical, Medieval, Renaissance, and Modern times.

271–72 *Museum Techniques** (arr.) MacDonald
Academic year—as arranged. Assignments in intern training in museum work. Students may take this course three days a week from 9:00 A.M. to 5:00 P.M. throughout the academic year and earn 3 credits a semester; or they may take it intensively, 5 days a week from 9:00 A.M. to 5:00 P.M., and earn 6 credits in one semester.

289–90 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

DRAWING AND PAINTING, SCULPTURE, AND COMMERCIAL ART

First Group

21–22 *Basic Composition and Techniques†* (3–3) Forsythe
Academic year—day and evening; summer 1962—Art 21 (3). Study of the fundamentals of two- and three-dimensional composition; an investigation of materials and their application.

41–42 *Drawing and Perspective* (3–3) Russo
Academic year—day and evening; summer 1962—Art 41 (3). An introductory course in object and figure drawing and mechanical perspective.

65–66 *Drawing and Painting I—Life, Still Life, and Portrait* (3–3) The Staff
Academic year—day; summer 1962—Art 65 (3).

81–82 *Sculpture I* (3–3) Warneke
Academic year—day and evening.

Second Group

125–26 *Drawing and Painting II—Life, Still Life, and Portrait* (6–6) Sickman
Academic year—day.

* Primarily for candidates for the degree of Master of Arts in the field of Museology and students in the Special Program in Museum Training.
† Art 21–22 is prerequisite to all other studio courses.

127–28 *Drawing and Painting II—Life and Portrait* (6–6) Archer
Academic year—day and evening.

135 *Commercial Design* (3) Hine
Summer 1962. Studies of the principles and applications of graphic design.

157–58 *Print Making* (6–6) Perlmutter
Academic year—day. Relief printing and wood block, with special reference to western and eastern techniques.

159–60 *Anatomy and Techniques* (6–6) Russo
Academic year—day. Special problems in anatomy and drawing and painting of the life model in action.

165–66 *Drawing and Painting II—Life and Portrait* (6–6) Lahey
Academic year—day and evening; summer 1962—Art 165 (3)*.

175–76 *Advanced Composition* (6–6) Forsythe
Academic year—day and evening; summer 1962—Art 175 (3)*. Advanced problems in creative design and composition; development of representational skills.

179–80 *Sculpture II* (6–6) Warneke
Academic year—day and evening. Portrait-life modeling and composition in clay, plaster and wood carving.

183–84 *Commercial Art* (6–6) Hine
Academic year—day and evening. Instruction in fundamental principles: to analyze, visualize, and skillfully express ideas.

185–86 *Advanced Commercial Art* (6–6) Hine
Academic year—day and evening. Practice in the development of professional techniques for thumb-nail and comprehensive layouts; preparation of professional portfolio.

189–90 *Advanced Sculpture* (6–6) Warneke
Academic year—day and evening. Advanced problems in modeling and direct carving. (Restricted to students who have completed 18 hours of sculpture).

Third Group

265–66 *Painting III* (6–6) The Staff
Academic year—day and evening; summer 1962—Art 265 (3)*.

275 *Painting IV* (6) The Staff
Fall—as arranged; spring—as arranged; summer 1962—Art 275 (3)*.

279–80 *Sculpture III* (6–6) Warneke
Academic year—as arranged.

281 *Sculpture IV* (6) Warneke
Fall—as arranged; spring—as arranged.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

MUSIC

First Group

3–4 *Music Appreciation* (3–3) Steiner
Academic year—day and evening; summer 1962—Music 3 (3). An introduction to the historical sequences of musical style, the elements of music principle and musical

* May be taken for 6 semester hours with the approval of the instructor.

forms, the works of the chief composers, and the study of instruments and other media of musical presentation.

5–6 *Fundamentals of Music* (3–3) Steiner
Academic year—evening. Elements of music—basic concepts of pitch, rhythm, scales, intervals and chords, notation and terms.

51–52 *Orchestra* (1–1) Steiner
Academic year—evening. Preparation and performance of orchestral literature. Prerequisite: audition before Director.

SECOND GROUP

103–4 *History of Music* (3–3)
Academic year—day; summer 1962—Art 103 (3). The development of music in the Western World from the Early Christian era to the 20th century.

131–32 *Harmony* (3–3)
Academic year—evening. Chord structure, inversions, modulations, figured and unfigured bass. Practice in elementary harmonic writing.

RELATED COURSE IN ANOTHER DEPARTMENT

Classical Languages and Literatures 71–72 *Greek and Roman Backgrounds in Literature* (3–3)

BIOCHEMISTRY*

Professors J. H. Roe *(Emeritus)*, C. R. Treadwell *(Chairman)*
Professorial Lecturers W. R. Carroll, Irving Gray, Arthur Weissbach
Associate Professor B. W. Smith
Associate Professorial Lecturer Leon Swell
Assistant Professors G. V. Vahouny, J. M. Bailey

Master of Arts or *Master of Science in the field of Biochemistry.*—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree. The undergraduate program must have included the following courses, or the equivalent: Biology 1–2†; Chemistry 11–12, 21, 22, 151–52; Physics 11 and 12.

Required: the general requirements, pages 43–45, including Biochemistry 221–22, 225–26, 227–28, 299–300. The remaining courses are to be selected from Biochemistry 224, 232, 241, 251, 261, 295–96, or, with the approval of the adviser, from graduate courses in Microbiology, Chemistry, Physiology, or Pharmacology. It is usually not possible to arrange courses and research so that the student can be assured of completing all of the required work in one academic year.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

221–22 *Biochemistry* (4–4) Vahouny
Academic year—Tues. and Thurs., 8:00 to 12:00 A.M. A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 22 and 152. Material fee, $15 a semester.

224 *Biochemistry of the Enzymes* (1) Weissbach
Spring—Mon., 5:00 P.M. Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.

* The Staff of Instruction here listed is for the academic year 1961–62.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

225-26 *Biochemical Procedures* (3–3) Smith and Staff
Academic year—as arranged. A laboratory course. Material fee, $16 a semester.

227-28 *Biochemistry Seminar* (1–1) The Staff
Academic year—Fri., 4:00 P.M. The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.

232 *Proteins and Amino Acids* (1) Carroll
Spring—Wed., 5:00 P.M. A lecture course. Prerequisite: Biochemistry 113 or 221.

241 *Isotopes* (2) Gray
Fall—Sat., 8:00 A.M. Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromotography.

249-50 *Introduction to Medical Research** (3–3) Bailey
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

251 *Carbohydrate Metabolism* (1) Roe
1962–63 and alternate years: fall—Sat., 9:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

261 *Biochemistry of the Lipids* (1) Swell, Treadwell
Fall—Sat., 12:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

295-96 *Research in Biochemistry* (arr.) The Staff
Academic year—as arranged.

299-300 *Thesis* (3–3) The Staff

BIOLOGY

Beginning with the academic year 1962–63 the work toward Bachelor's and Master's degrees in Biology will be offered jointly by the departments of Botany and Zoology.

In the summer of 1962 the following courses will be offered by the Department of Biology.

1-2 *Survey in Biology* (3–3)
Summer 1962. Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to organic evolution, heredity, public health, and conservation. Material fee, $7 for each half. Biology 1 is not prerequisite to Biology 2.

115 *Cytology* (3)
Summer 1962. Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Prerequisite: one year of college work in biology, botany, or zoology. Material fee, $8.

211-12 *Research in Cytology* (arr.)
Summer 1962. Individual problems for advanced students interested in this field.

299-300 *Thesis* (3–3)
Summer 1962.

*This is an interdepartmental course. The student should register in the department directing his research.

BOTANY*

Professor R. B. Stevens *(Chairman)*
Professorial Lecturer L. B. Smith
Associate Research Professor J. M. Kaper
Associate Professorial Lecturers Kittie Parker, Caroline Adams, R. S. Sigafoos, Edward Hacskaylo, H. M. Cathey
Lecturers G. A. Livingston, W. A. Shropshire, Jr.

Bachelor of Arts or *Bachelor of Science with a major in Botany (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32, including Biology 1–2†, or the equivalent.

Required: in addition to the general requirements, pages 37–42, a minimum of twenty-four semester hours of second-group courses in Botany or in a combination of Botany and related sciences as approved by the Chairman.

Bachelor of Arts or *Bachelor of Science with a major in Biology (Departmental).*—This interdepartmental major may be arranged in conjunction with the Department of Zoology. Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32, including Biology 1–2†, or the equivalent.

Required: in addition to the general requirements, pages 37–42, a minimum of twenty-four semester hours of second-group courses in Botany and Zoology, as approved by the Chairman of either Department.

Master of Arts or *Master of Science in the field of Botany.*—Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Botany or Biology.

Required: the general requirements, pages 43–45.

Master of Arts or *Master of Science in the field of Biology.*—This interdepartmental field may be arranged in conjunction with the Department of Zoology. Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Botany, Zoology, or Biology.

Required: the general requirements, pages 43–45.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

BIOLOGY‡

First Group

The Staff

1–2 *Introductory Biology*‡ (4–4)

An interdepartmental course. Lecture (2 hours), laboratory (4 hours).

Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.

Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.

This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

BOTANY

Second Group‡

Parker

105 *Field Botany* (3)

Lecture (1 hour), laboratory and field (4 hours). 1963 and alternate summers. A course, primarily for nonspecialists, emphasizing local flora.

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* The Staff of Instruction here listed is for the academic year 1961–62.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

‡ Biology 1–2 is prerequisite to all second-group courses, except by permission of the instructor. Beginning with the academic year 1962–63, Biology 1–2 *Introductory Biology* (4–4) replaces Botany 1–2 *General Botany* (3–3) and Zoology 1–2 *Introduction to Zoology* (4–4). Botany 1–2 and Zoology 1–2 will be offered for the last time in the summer of 1962.

106 *Plant Growth* (3) — Hacskaylo, Shropshire
Lecture (2 hours), laboratory (2 hours). Summer 1962 (as Botany 116). 1962 and alternate summers. A course, primarily for nonspecialists, emphasizing practical problems of growing and caring for plants. Material fee, $8.

107–8 *Organic Evolution** (3–3) — Bowman
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. A study of the theories of organic evolution and present ideas on the principal lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechanisms involved in this process from the fields of genetics and cytology.

109–10 *Plant Morphology* (3–3) — Adams
1963–64 and alternate years. *First half:* seed plants—lecture (2 hours), laboratory (2 hours); material fee, $8. *Second half:* lower groups—lecture (1 hour), laboratory and field (4 hours).

115–16 *Cytology** (3–3) — Bowman
Lecture and laboratory. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—Botany 115 (3) (as Biology 115). Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Material fee, $8 a semester.

125–26 *Plant Taxonomy* (3–3) — Parker
Lecture (1 hour), laboratory and field (4 hours). 1963–64 and alternate years.

127 *Genetics** (3) —
Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man.

131–32 *Mycology* (3–3) — Stevens, Hacskaylo
Lecture (2 hours), laboratory (2 hours). 1962–63 and alternate years: academic year—evening. Material fee, $8 a semester.

133–34 *Plant Pathology* (3–3) — Stevens
Lecture (2 hours), laboratory (2 hours). 1963–64 and alternate years. Material fee, $8 a semester.

135–36 *Plant Physiology* (3–3) — Cathey
Lecture (2 hours), laboratory (2 hours). 1962–63 and alternate years: academic year—evening. Prerequisite: Chemistry 11–12 or permission of the instructor. Material fee, $8 a semester.

140 *Cell Physiology** (3) — Shropshire
Spring—evening. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12.

141–42 *Plant Ecology* (3–3) — Sigafoos
Lecture (1 hour), laboratory and field (4 hours). 1962–63 and alternate years: academic year—evening.

Third Group

201–2 *Seminar: Cytology** (3–3) — Bowman
Academic year—evening.

221–22 *Seminar: Taxonomy* (3–3) — Smith
1962–63 and every fourth year: academic year—as arranged.

231–32 *Seminar: Mycology and Plant Pathology* (3–3) — Stevens
1964–65 and every fourth year.

*An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

235–36 *Seminar: Plant Physiology* (3–3) Cathey, Hacskaylo
1963–64 and every fourth year.

241–42 *Seminar: Plant Ecology* (3–3) Sigafoos
1965–66 and every fourth year.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962—Botany 295 (arr.) Fee to be arranged.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

CHEMISTRY*

Professors B. D. Van Evera, S. N. Wrenn, C. R. Naeser *(Chairman)*, R. C. Vincent, W. F. Sager, R. E. Wood, T. P. Perros
Associate Professors J. W. Harkness, W. E. Schmidt, D. G. White
Associate Professorial Lecturer Margaret McPherson
Assistant Professors R. C. Sentz, Margaret Ethier

Registration.—Before completing registration each student must obtain from the representative of the Department an assignment to lecture, recitation, and laboratory sections.

Bachelor of Arts or *Bachelor of Science with a major in Chemistry (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32, including Chemistry 11–12, 21, and 22, Mathematics 29 and 30 or 22 and 23, Physics 11, 12, 13, 16; or 11, 14, 15, and 16.

Required: the general requirements, pages 37–42, including Chemistry 111–12, 113–14, 122, 134 (or 235–36), 151–52, and 135 or 155 (two semester hours), and a grade of "pass" on the chemistry major examination at the end of the senior year. The correlated knowledge upon which the student will be examined includes the following fields: (1) analytical chemistry, (2) inorganic chemistry, (3) organic chemistry, (4) physical chemistry. The work of the junior and senior years must be approved by the Department. Chemistry 153 and the German language are required of all majors who wish to be certified to the American Chemical Society. Others may omit Chemistry 153 and may elect French or Russian. Two foreign languages are recommended for students planning to do graduate work.

Master of Arts or *Master of Science in the field of Chemistry.*—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Chemistry from this University, or the equivalent.

Required: the general requirements, pages 43–45. All prospective Master's candidates must take qualifying examinations in the fields of analytical, inorganic, organic, and physical chemistry. These examinations will be given during the first week of classes each semester, and are a part of the prerequisites for all advanced courses. At least two of these examinations must be taken at the beginning of the first year of registration and the remaining one(s) must be taken at the beginning of the second year. Deficiencies, if any, shall be eliminated by assignment to appropriate courses in the 100 group for which a limited amount of graduate credit may, upon petition, be assigned for courses normally taken by seniors. The thirty hours of required work must include Chemistry 213 and at least one three semester hour course in the 200 group in two of the three fields of analytical, inorganic, and organic chemistry. In addition, the thirty hours must include at least four semester hours of laboratory work, Chemistry 193 and 299–300. Chemistry 156 is prerequisite to thesis work in the field of organic chemistry. A reading knowledge examination in French or German (German preferred) must be passed before the second half of the work is started.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Science in Engineering with an option in Chemistry (School of Engineering).—See the School of Engineering Catalogue. The Chemistry courses required for this

* The Staff of Instruction here listed is for the academic year 1961–62.

egree are the same as those required for the Bachelor of Science degree with the major e Chemistry as itemized above.

Bachelor of Arts in Education with a teaching field in Chemistry (School of Education). Prerequisite: the Education curriculum, page 34.

Required: the Chemistry option and the professional courses listed in the School of Education Catalogue.

First Group

1-4 *Fundamentals of Physical Science* (4–4) — Schmidt, Ethier

A year course: credit is not given for the first half until the second half is completed. Lecture (3 hours), laboratory (3 hours). Academic year—day. Introduction to methods and achievements of physical science, covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, $11 a semester.

11-12 *General Chemistry* (4–4) — The Staff

A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. Elementary course in general chemistry. Prerequisite: one year of high school algebra. Laboratory fee, $18 a semester.

13-14 *General Chemistry* (4–4) — White

A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). Academic year—day and evening. A terminal course in general chemistry for students in the School of Engineering except those selecting the curriculum leading to the degree of Bachelor of Science in Engineering with a chemistry option. Those students should register for Chemistry 11–12 in their first year. Prerequisite: Physics 11 and Mathematics 21 or 29. Laboratory fee, $18 a semester.

21 *Qualitative Inorganic Analysis* (4) — Vincent

Lecture (2 hours), laboratory (6 hours). Fall—day and evening; spring—day and evening; summer 1962. Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12 or a placement examination which may be waived at the discretion of the instructor. Laboratory fee, $18.

22 *Quantitative Inorganic Analysis I* (4) — Schmidt

Lecture (2 hours), laboratory (6 hours). Spring—day and evening; summer 1962. Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, $18.

Second Group

111-12 *Physical Chemistry Lectures* (3–3) — Wood

A year course: credit is not given for the first half until the second half is completed. Academic year—day and evening. Introduction to physical chemistry. Students registering for Chemistry 111–12 must register concurrently for Chemistry 113–14 unless they already have adequate credit for physical chemistry laboratory. Prerequisite: (1) Chemistry 22 and 152, Mathematics 22 or 30, Physics 13 or 15, or (2) Chemistry 21, Mathematics 22 or 30, Physics 14.

113-14 *Physical Chemistry Laboratory* (2–2) — Wood

A year course: credit is not given for the first half until the second half is completed. Academic year—day (also Saturday). Laboratory to accompany Chemistry 111–12. Students registering for Chemistry 113–14 must register concurrently for Chemistry 111–12 unless they already have credit for lectures in physical chemistry. Laboratory fee, $18 a semester.

122 *Quantitative Inorganic Analysis II* (4) — Schmidt

Lecture (2 hours), laboratory (6 hours). Fall—day and evening. Continuation of Chemistry 22 including theory and practice of separations, organic reagents, electrochemistry, and colorimetry in analysis. Prerequisite: Chemistry 22. Laboratory fee, $18.

134 *Descriptive Inorganic Chemistry* (2) White
Spring—day. An intermediate level course emphasizing the descriptive chemistry of the elements. Prerequisite: Chemistry 22, 151.

135–36 *Inorganic Chemistry: Preparations* (2–2) Perros
First half: fall—day, spring—evening. *Second half:* spring—evening. Application of the technique of inorganic chemistry to the preparation and purification of a list of selected substances. Prerequisite: Chemistry 152 and 134. Laboratory fee, $18 a semester.

151–52 *Organic Chemistry* (4–4) Wrenn, Sager
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—lecture (3 hours), laboratory (3 hours), day and evening; summer 1962. *Second half:* spring—lecture (2 hours), laboratory (6 hours), day and evening; summer 1962. Chemistry of the compounds of carbon. Prerequisite*: Chemistry 21. Laboratory fee: Chemistry 151, $12; Chemistry 152, $20.

153 *Special Laboratory in Organic Chemistry* (1) Wrenn, Sager
Spring—day and evening. A course designed to give the chemistry major additional and broader training in the technique of organic chemistry than in Chemistry 151–52. Prerequisite: Chemistry 151. Prerequisite or concurrent registration: Chemistry 22 and 152. Laboratory fee, $12.

155 *Organic Chemistry: Preparations* (2 or 3) Wrenn
Spring—evening. Synthesis of organic compounds and application of the technique of organic chemistry to the preparation of pure compounds, using larger amounts and greater refinements than in Chemistry 151–52. Prerequisite: Chemistry 22 and 152. Laboratory fee, $10.50 a semester hour.

156 *Qualitative Organic Analysis* (3) Sentz
Fall: lecture (1 hour), laboratory (6 hours)—evening. Identification of pure organic compounds, separation of mixtures, and identification of their components. Required of all students planning thesis work in Organic Chemistry. Prerequisite: Chemistry 22 and 152. Laboratory fee, $18.

191 *History of Chemistry* (2) Perros
1963–64 and alternate years. Historical development of chemistry. Prerequisite: Chemistry 22 and 152.

193 *Chemical Literature* (1) Wrenn
Fall—evening. A general course in chemical literature with reference work and reports. Prerequisite: Chemistry 22 and 152. Prerequisite or concurrent registration: Chemistry 111–12 and 113–14.

THIRD GROUP†

203 *Chemical Kinetics* (2) Wood
1963–64 and alternate years. The rates of chemical reactions and the factors influencing them. Prerequisite: Chemistry 112.

211–12 *Physical Chemistry* (2–1) Wood
Academic year—day and evening. Same course as 111–12. Chemistry 211–12 may be taken for credit only by special permission. Credit will be assigned only upon the satisfactory completion of Chemistry 213.

213 *Chemical Thermodynamics* (3) Wood
Fall—evening. Application of thermodynamics to chemical problems. Thermochemistry, homogeneous and heterogeneous equilibria, statistical calculation of thermo-

* This prerequisite may be waived in the case of the student who has earned a grade of *C* or better in Chemistry 12 within the past two years or by a placement examination.
† The appropriate qualifying examination is prerequisite to all advanced courses.

dynamic properties, electrochemistry. Prerequisite: grade of *A* or *B* in Chemistry 111–12, *Satisfactory* in 211–12, or qualifying grade in physical chemistry qualifying examination.

216 *Statistical Mechanics* (3) Sager
1962–63 and alternate years: fall—evening. An introduction to classical and quantum statistics designed to acquaint the student with the basic principles and application of the method. Prerequisite or concurrent registration: Chemistry 213 or permission of instructor.

217 *Chemical Bonding* (2) Sager
1962–63 and alternate years: spring—evening. A survey of modern developments in the theory of valence with emphasis on application to problems of stability and structure of complex molecules. Prerequisite: Chemistry 213 or permission of instructor.

221–22 *Advanced Analytical Chemistry* (2 or 3–2 or 3) Schmidt
Lecture (2 hours), laboratory (3 hours—optional). *First half:* fall—evening. *Second half:* not offered 1962–63. Theory and application of recent methods of analysis including electrical and optical instrumentation. Prerequisite: Chemistry 22 and 122. The lectures may be taken for 2 credits a semester without laboratory work, either half may be taken first. Laboratory fee, $11 a semester.

231–32 *Special Topics in Inorganic Chemistry* (2–2) White, Perros
Academic year—evening. A series of one-semester courses covering such topics as (1) chemistry of the less familiar elements, (2) organometallic, organosilicon, and carbonyl compounds, and (3) co-ordination chemistry. Prerequisite: Chemistry 235.

241–42 *Radiochemistry* (2–2)
1962–63 and alternate years: academic year—evening. The preparation, properties, and uses of radioactive isotopes, both natural and artificial. Prerequisite: Chemistry 235–36.

235–36 *Inorganic Chemistry* (3–2) Nacser
Academic year—evening. Application of modern chemical theories to inorganic substances and reactions, followed by a detailed study, developed from the periodic table, of the chemistry of the more common elements. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111–12 and 113–14.

251–52 *Advanced Organic Chemistry* (3–3) Sager
Academic year—evening. Syntheses, reactions, and properties of carbon compounds, fundamental theories of organic chemistry. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111–12, 113–14.

253 *Advanced Synthetic Organic Chemistry* (3) Wrenn
Spring—evening. Study of reactions employed in the synthesis of organic compounds. Prerequisite: Chemistry 251.

257 *Theoretical Organic Chemistry* (3) Sager
1962–64 and alternate years. Survey of modern theories of organic chemistry with emphasis on reaction mechanisms. Prerequisite: Chemistry 252.

291–92 *Seminars: Recent Developments in Chemistry* (1–1) The Staff
Academic year—day.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962. Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, $7.50 a semester hour.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962. Laboratory fee, $18 a semester.

CLASSICAL LANGUAGES AND LITERATURES

Professor J. F. Latimer *(Chairman)*
Associate R. G. Crawford

Bachelor of Arts with a major in Latin.—Prerequisite: the Arts and Letters curriculum, page 32, including Latin 51–52 and History 39–40.

Required: in addition to the general requirements, pages 37–42, eighteen semester hours in Latin beyond first-group courses, Art 111, Philosophy 111. A reading knowledge of French or German, preferably both, is strongly recommended.

Latin 1–2 and 3–4, or Greek 11–12 and 13–14 satisfies the foreign language requirement, see page 31.

LATIN AND GREEK

First Group

1–2 *First-year Latin* (3–3) The Staff

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Functional presentation of the essentials of the language, with appropriate reading selections; development of English derivatives; introduction to Roman life and literature.

3–4 *Second-year Latin* (3–3) Crawford

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. A continuation of the first-year course, but with increased emphasis on Latin readings which illustrate Roman life and literature; continuation of vocabulary building in English. Prerequisite: Latin 1–2 or two years of high school Latin.

11–12 *First-year Greek* (3–3) The Staff

A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Essentials of grammar with appropriate reading selections.

13–14 *Second-year Greek* (3–3) The Staff

A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. 1963–64 and alternate years: academic year—evening; 1964–65 and alternate years: academic year—day. Review of grammar; rapid reading from selected Greek authors.

49–50 *Latin Grammar and Readings* (3–3) The Staff

1963–64 and alternate years: academic year—day. Primarily for graduate students preparing for reading examinations. Undergraduates admitted by permission of the instructor. No academic credit for graduate students. *First half*: essentials of Latin grammar with appropriate reading selections. *Second half*: continuation of grammar with selections from various Latin authors for rapid reading.

51–52 *Introduction to Latin Prose and Poetry* (3–3) The Staff

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Selections from Cicero and Caesar, Virgil and Ovid. Prerequisite: Latin 3–4 or three years of high school Latin.

Second Group

101–2 *Roman Comedy* (3–3) The Staff

1963–64 and alternate years: academic year—day. Selected plays from Plautus and Terence. Prerequisite: Latin 51–52 or permission of the Instructor.

111–12 *Roman History and Philosophy* (3–3) The Staff
Not offered 1962–63. Selections from Cicero, Sallust, Lucretius, and Livy. Prerequisite: Latin 51–52 or permission of the Instructor.

121–22 *Roman Lyric Poetry and Satire* (3–3) The Staff
Not offered 1962–63. Selections from Catullus, Horace, Juvenal, and Martial. Prerequisite: Latin 101–2 or permission of the Instructor.

COURSES IN ENGLISH TRANSLATION

First Group

71–72 *Greek and Roman Backgrounds in Literature* (3–3) Latimer
First half: 1962–63 and alternate years: spring—day. *Second half:* 1963–64 and alternate years: fall—day. Selected Greek and Roman masterpieces and their literary influence. This course satisfies the literature requirement, see page 31.

Second Group

109–10 *Greek and Roman Drama* (3–3) The Staff
Not offered 1962–63. 1963–64 and alternate years: academic year—evening; 1964–65 and alternate years: academic year—day. Selected tragedies of Aeschylus, Sophocles, Euripides, and Seneca; selected comedies of Aristophanes and Menander, Plautus and Terence; historical development of classical drama.

CLASSICAL HEBREW

First Group

21–22 *First-year Classical Hebrew* (3–3) Seidman
A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Fundamental principles of the language with practice in reading simple narrative prose.

23–24 *Second-year Classical Hebrew* (3–3) Seidman
A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. 1963–64 and alternate years: academic year—day; 1964–65 and alternate years: academic year—evening. Review of grammar and exegesis of selected passages from the Hebrew text of the Old Testament.

ECONOMICS*

Professors A. E. Burnst, D. S. Watson, T. W. Holland, J. W. Kendrick, W. E. Schmidt
Professorial Lecturers Gerhard Colm, R. A. Young, Hans Heymann, Jr.
Associate Professors J. W. Skinner *(Chairman)*, Henry Solomon *(Research)*
Associate Professorial Lecturer R. L. Sammons

Bachelor of Arts with a major in Economics (Departmental).— Prerequisite: the Arts and Letters curriculum, page 32, including Economics 1–2 and Statistics 51.
Required: the general requirements, pages 37–42, and 51 Economics 101–2 and 121 and seven additional hours in second-group courses to be selected with the approval of the adviser; (2) Economics 198 which may be taken upon the completion of Economics 101–2 and 121; (3) Statistics 111, 112; (4) nine semester hours of other second-group courses selected with the approval of the adviser.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On sabbatical leave spring semester 1961–62.

Bachelor of Arts with a major in Latin American Civilization (Field-of-Study).—See the Department of History.

Master of Arts in the field of Economics.—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or the equivalent.

Required: the general requirements, pages 43–45, including Economics 210, at least nine semester hours in economic theory, and a thesis (Economics 299–300).

Doctor of Philosophy (Graduate Council).—See the pamphlet of the Graduate Council.

Master of Arts in Government with a major in Economic Policy (School of Government, Business, and International Affairs).—See the general catalogue.

First Group

1–2 *Principles of Economics (3–3)** — Skinner and Staff

Lecture (2 hours), recitation (1 hour). *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—evening; spring—day and evening; summer 1962. Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

Second Group

101–2 *Economic Analysis* (3–3) — The Staff

First half: fall—day and evening; spring—evening; summer 1962. *Second half:* spring—day and evening. Analysis of demand, supply, and commodity pricing; theory of national income determination; pricing of productive services; welfare economics. Economics 101 is prerequisite to Economics 102.

104 *History of Economic Thought* (3) — Burns

Spring—day. History of the major schools of economic thought; influence of changing problems on the development of economic theory.

105 *Business Cycles* (3) — Kendrick

Fall—evening. Description and analysis of the facts of economic instability, survey of recent business cycle theory, forecasting, and consideration of counter-cyclical policies.

121 *Money and Banking* (3)

Fall—day and evening; spring—evening; summer 1962. Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.

123 *Monetary Theory and Policy* (3)

Fall—day. Principal contemporary theories, background of recent monetary policy.

133 *The Economy of the Soviet Union* (3)

Not offered 1962–63. Development and main features of the economic life of the Soviet Union (See History 145–46 and Geography 196).

141 *Unionism and Collective Bargaining* (3) — Holland

Fall—evening. The development and characteristics of American unionism and collective bargaining as economic and social institutions, appraisal of economic and social aspects, public policies and controls.

142 *Labor Economics* (3) — Holland

Spring—evening. Characteristics of the American labor force, operations of labor markets, wage theories and practices, impact of collective bargaining, causes and characteristics of unemployment, public policies and programs.

161–62 *Public Finance and Taxation* (3–3)

1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. General survey of government expenditures; sources and methods of taxation; economic effects of expenditures, taxes, and of government debt policies.

* Economics 1–2 is prerequisite to all other courses in Economics.

165 *Government Control of Economic Activity* (3) Watson
Fall—day. Changing role of government in promoting and regulating economic activity, types and spheres of control.

181–82 *International Economics* (3–3) Schmidt
Academic year—day and evening; summer 1962—Economics 181 (3). Survey of world economics, theories of international trade, analysis of international economic problems and the international organizations.

185–86 *Economic History and Problems of Latin America* (3–3) ———
Academic year—evening. Evolution of the economies of Latin America with particular emphasis on present structures and problems, considered in the regional, country, and sub-region contexts. Economics 185, special attention to Middle America; Economics 186, special attention to South America.

198 *Proseminar in Economics* (3) Skinner
Fall—as arranged; spring—as arranged. Comprehensive survey of economics. Prerequisite: Economics 101–2 and 121.

THIRD GROUP

201–2 *History and Literature of Economic Thought* (3–3) Burns
Academic year—evening. Critical analysis and interpretation of the development and the literature of economic thought, origins, and problems, of the major types of theory, and their relation to present problems and policies.

203–4 *Contemporary Economic Theory* (3–3) Watson
Academic year—evening. The contributions of Marshall, Chamberlin, Robinson, Hicks, and others.

205 *Theory of Employment and Income* (3) Kendrick
Fall—evening. Determinants of the level of employment and income. Keynesian and classical systems contrasted, and recent literature on the subject.

206 *Business Cycle Analysis* (3) Kendrick
Spring—evening. Empirical analysis of American business cycles; evaluation of the methodology and findings of the National Bureau of Economic Research. Statistical tests of theories of the business cycle.

208 *The National Income* (3) Kendrick
Spring—evening. The theory of economic aggregates; measurement and policy aspects of national income.

210 *Seminar in Economics* (3) Skinner
Academic year—evening. Methodology of economics, integration of economic theories, methods of research. Open only to students who have completed fifteen hours of graduate work in economics.

212 *Seminar in Price Theory* (3) Watson
Fall—evening. Advanced topics in the theory of relative prices. Prerequisite: Economics 203–4 or the equivalent.

213 *Economic Thought in the Twentieth Century* (3) Burns
Summer 1962. Continuation of Economics 201–2. The principal trends in economic thought during the present century.

215–16 *Mathematical Economics* (3–3) Solomon
Academic year—evening. Introduction to the uses of mathematics in economic theory.

217–18 *Survey of Economics* (3–3) ———
Academic year—evening. Survey of economic analysis and policy. Not open to graduate students in economics or economic policy.

219 *Managerial Economics* (3) Watson
Summer 1962. Analysis of price, production, and inventory policies of business firms.

221–22 *Monetary Theory* (3–3)
Academic year—evening. Contemporary monetary theories.

223–24 *Monetary Policy and Central Banking* (3–3)
Academic year—evening. The money system in its relation to national income: monetary policies of the Federal Reserve and other central banking systems.

231–32 *Quantitative Economics* (3–3) Solomon
Academic year—evening. Selected topics in quantitative economics.

241 *Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Fall—evening. An accelerated introductory course in labor economics primarily for graduate students in Personnel Administration.

244 *Problems in Unionism, Collective Bargaining, and Labor Economics* (3) Holland
Spring—evening. Concentrated study of selected economic, social, and legal aspects of labor relations and labor economics.

246 *Foreign Labor Movements* (3) Holland
Spring—evening. Labor in the economic, social, and political structures of selected foreign countries. Contrasts and comparisons with the United States.

251 *Theories of Economic Development* (3) Schmidt
Fall—evening; summer 1962. Growth and change in economic activity, capital accumulation, innovations in technology and business organization.

253 *Productivity Analysis* (3) Kendrick
Fall—evening. Concepts and measures of productivity; relations to economic growth and to structural changes in the American economy.

261–62 *Public Finance and Fiscal Policy* (3–3) Colm
Academic year—evening. Special problems in contemporary public finance and fiscal policy.

263–64 *Theory of Public Finance* (3–3)
Academic year—evening. Criteria for the allocation of government expenditures, principles of taxation, fiscal policy for stable growth.

265–66 *Theory of Economic Policy* (3–3) Watson
Academic year—evening. The nature, forms, methods, and objectives of economic policy; the relation of economic theory to economic policy.

267 *Economic Organization of the Communist Orbit* (3) Heymann
Fall—evening. Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. (See also History 145–46, 247, and Geography 196.)

281–82 *International Economics* (3–3) Schmidt
Academic year—evening. The modern theories of international economics, the variables determining the balance of payments, techniques to obtain balance of payments equilibrium.

284 *United States Foreign Economic Policy* (3) Schmidt
Not offered 1962-63. Analysis of foreign aid program; international, commercial, and monetary policy of the United States; United States and international economic organization.

285–86 *Economic Development of Latin America* (3–3) Sammons
Academic year—evening. Current policies and programs, capital formation, public and private; foreign loans and investment; social and technological preconditions of investment.

287–88 *Latin America: Trade and Commodity Policy* (3–3)
Not offered 1962–63. Tariffs and exchange control systems, bilateral and general commercial agreements, terms of trade.

290 *Seminar in International Economics* (3) Schmidt
Spring—evening. Advanced topics in international economics. Prerequisite: Economics 281–82 or the equivalent.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

ENGLISH*

Professors E. S. Shepard, F. S. Tupper, C. D. Linton, C. W. Cole *(Chairman)*, R. H. Moore, J. H. Coberly, P. H. Highfill, Jr.
Associate Professors W. L. Turner, Muriel McClanahan, J. G. Allee, Jr., J. P. Reesing, Jr., R. H. Walker, Jr.
Assistant Professors R. E. Gajdusek, Elizabeth Wright, Nancy Tischler, J. G. Sweeney, M. E. Lyon
Instructors Jane Bauman, R. C. Rutledge, E. N. Harbert

Bachelor of Arts with a major in American Thought and Civilization (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 32.
Required: the general requirements, pages 37–42, and the grade "pass" on the American Thought and Civilization major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined is summarized under four general headings: (1) European cultural history—the Renaissance and modern social and intellectual cultures as a background to contemporary civilization with particular attention to English literature and history from the 16th through the 19th centuries; (2) American history—the political, economic, social, and religious thought and experience of the American people; (3) American philosophy and fine arts—a survey of periods and movements with a knowledge of outstanding individuals; (4) American literature—a knowledge of major writers, together with a study of poetry, fiction, and drama. The Department of English provides a proseminar (English 179–80) intended to assist the student in preparing himself for the major examination. The major adviser will give to each student at registration a check list of available courses grouped as prerequisite, necessary, or desirable for the completion of the major study program.

Bachelor of Arts with a major in English Literature (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 32. It is recommended that prospective majors elect English 91–92 from among the listed offerings.
Required: the general requirements, pages 37–42, and the passing of the English Literature major examination at the end of the senior year. The field of coordinated knowledge upon which the student will be examined at the end of his senior year is summarized under the following general headings: (1) the history of English literature from the Anglo-Saxon period; (2) the chief English writers (a certain familiarity with each man and his main works and a detailed knowledge of Shakespeare); (3) English social and cultural history as it bears upon or is reflected in the literature; (4) European intellectual backgrounds and movements which have affected English literature. The proportion of work taken in each of these areas should be worked out by the student in consultation with one of the English Literature advisers. The Department of English provides a proseminar (English 199–200) to assist the student in preparing himself for the major examination. A detailed description of the major is available in the Office of the Dean of Columbian College.

Master of Arts in the field of American Literary and Cultural History.—Prerequisite: the equivalent of an undergraduate major in this University in (1) History (with American history as a major part), (2) American Thought and Civilization, or (3) English literature (with introductory courses in American literature and American history). The student who has not taken any of the above majors at this University must take a candidacy examination.

* The Staff of Instruction here listed is for the academic year 1961–62.

Required: in addition to the general requirements, pages 43–45, the following specific requirements must be met: twelve of the required semester hours must be of seminar study, six in American history and six in American literature; twelve of the required semester hours must be of second and third group courses in the fields of American history, literature, philosophy, education, and art recommended by the adviser; a thesis (six semester hours) in any of the foregoing fields or in some combination of them. Because of the various undergraduate majors which will be accepted for admission to this program, a basic reading list is assigned to all students, to assist in preparing them for the final Master's examination.

Master of Arts in the field of English and American Literature.—Prerequisite: an undergraduate major in English Literature or American Thought and Civilization at this University; or twenty-four semester hours in English and/or American literature above the sophomore level. The student who has not taken either of the above majors at this University must take a candidacy examination. The student offering split preparation (English and American literature) will be examined in English and American literature.

Required: in addition to the general requirements, pages 43–45, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; on the basis of the student's undergraduate preparation, to include a comprehensive survey of American literature and of English literature from 1600; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the major portion of the material falls; (3) a final written examination on American literature and on English literature from 1600.

Master of Arts in the field of English Literature.—Prerequisite: an undergraduate major in English Literature at this University, or twenty-four semester hours in English literature above the sophomore level. The student who has not passed the major examination in English at this University must take a candidacy examination which, in its scope and difficulty, is comparable to the major examination in English.

Required: in addition to the general requirements, pages 43–45, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the material falls; and (3) a final written examination.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Arts in Education with a teaching field in English (School of Education).—Prerequisite: the Education curriculum, page 34.

Required: the English option and the professional courses listed in the School of Education Catalogue.

ENGLISH COMPOSITION*

First Group

A *English for Foreign Students* (3) Allee and Staff

Fall—day and evening; spring—day and evening; summer 1962. A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B *English for Foreign Students* (3) Allee and Staff

Fall—evening; spring—day and evening. For second-semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

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* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

All students enrolled in curricula leading to Bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.

English 1 or 1X is prerequisite to all other courses in English. English 2 is the second half of the six-hour composition course requirement of students *not* required to follow the Columbian College of Arts and Sciences sequence.

1 *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. Review of grammar, exercises in composition, readings.

1X *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is $115 (the regular fee of $30 a semester hour, plus an additional fee of $25).

2 *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. For second-semester freshmen not following the Columbian College of Arts and Sciences sequence. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X.

4 *English Composition** (3) Moore and Staff
Fall—day and evening; spring—day and evening; summer 1962. The second half of the six-hour English Composition course required of students in Columbian College. A course in critical analysis and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X and both semesters of one of the introductory literature courses.

11 *The Writing of Reports* (3) Turner and Staff
Fall—day and evening; spring—day and evening; summer 1962. Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X, and 2 or 4.

Second Group

109 *Expository Writing* (3) McClanahan and Staff
Fall—evening. A study of types of expository writing with weekly exercises. Prerequisite: English 1 or 1X, and 2 or 4.

113 *Narrative Writing* (3) Gajdusek
Fall—evening. Study of the techniques of narrative writing and class criticism of student writing. Prerequisite: English 1 or 1X, and 2 or 4.

114 *The Writing of Fiction—the Short Story* (3) Gajdusek
Spring—evening. Prerequisite: English 113; consent of instructor.

116 *Advanced Exposition* (3) Moore
Not offered 1962-63. Theory and practice in the writing of expository articles and essays. Prerequisite: English 109; consent of instructor.

117-18 *The Writing of Fiction—the Novel* (3-3) Gajdusek
Academic year—evening. Writing a novel. Prerequisite: English 114; consent of instructor.

ENGLISH LITERATURE

First Group

51-52 *Introduction to English Literature*† (3-3) Tupper and Staff
Academic year—day and evening; summer 1962. A historical survey. Prerequisite: English 1 or 1X.

91-92 *Introduction to European Literature*† (3-3) Shepard and Staff
Academic year—day and evening. Consideration of various types. Prerequisite: English 1 or 1X.

* See footnote on page 74.
† See footnote (*) on page 76.

Second Group*

121–22 *English Literature from the Beginnings to 1500* (3–3) — Allee
First half: not offered 1962–63. *Second half:* spring—evening; summer 1962. *First half:* English literature prior to Chaucer. *Second half:* Chaucer.

125 *Introduction to English Linguistics* (3) — Allee
Fall—evening. The development of the English language in a historical treatment of English grammar.

129–30 *Elizabethan Nondramatic Literature* (3–3) — Tupper
Academic year—day. Nondramatic literature from 1485 to 1601.

135–36 *Shakespeare* (3–3) — Tupper
Academic year—day.

139–40 *The Seventeenth Century* (3–3) — Linton, Reesing
Academic year—evening; summer 1962—English 139 (3). *First half:* poetry and prose from 1603 to 1660. *Second half:* Milton.

141–42 *The Neoclassical Movement* (3–3) — Highfill
Academic year—day. Poetry and prose from 1660 through the mid-18th century.

151–52 *The Romantic Movement* (3–3) — Reesing
Not offered 1962–63. From the mid-18th century through Shelley and Keats.

161–62 *Victorian Literature* (3–3) — Shepard
Academic year—day. Poetry and prose from 1830 to 1900.

165–66 *The Twentieth Century* (3–3) — Linton
Academic year—day; summer 1962—English 166 (3). British poetry, prose, and drama since 1900.

181–82 *The English Novel* (3–3) — Reesing
Academic year—day. Major English novelists from the 18th century to the present day.

183–84 *The English Drama* (3–3) — Highfill
Academic year—evening. *First half:* concerned principally with the drama of Shakespeare's contemporaries. *Second half:* a historical survey from 1660 to the present day.

192 *Medieval Legend and Saga* (3) — Allee
Not offered 1962–63. Celtic and Norse.

199–200 *Proseminar: Readings for the English Literature Major* (3–3) — Tupper, Highfill
Academic year—day and evening. Conferences and group discussions.

Third Group

222 *The Age of Chaucer* (3) — Allee
Not offered 1962–63.

223–24 *Old English* (3–3) — Allee
Academic year—evening. English language and literature before 1100. *First half:* Old English grammar and readings. *Second half:* Beowulf.

225 *Applied Linguistics* (3)
Not offered 1962–63. Survey of the English language since 1850; introduction to analytical methods of structural linguistics and their application to modern American and British writing and to secondary school teaching of English.

* All students enrolled in curricula leading to Bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classical languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 15, both semesters of one of the introductory literature courses, and English 4.
English 51–52, 71–72, 91–92, Classical Languages 71–2, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second-group courses except English 125.

235–36 *Studies in Shakespeare and His Contemporaries* (3–3) Tupper
Summer 1962—English 236 (3). Prerequisite: English 135–36.

239–40 *Studies in Seventeenth Century Literature* (3–3) Reesing
Not offered 1962–63. Open to qualified undergraduates. *First half:* chief figures exclusive of Milton. *Second half:* Milton.

241–42 *Studies in Neoclassical Literature* (3–3) Highfill
Not offered 1962–63. Prerequisite: English 141–42.

251–52 *Studies in the Romantic Movement* (3–3) Reesing
Not offered 1962–63. Prerequisite: English 151–52.

261–62 *Studies in Victorian Literature* (3–3) Shepard
Not offered 1962–63. Prerequisite: English 161–62.

265–66 *Studies in Twentieth Century Literature* (3–3) Linton
Not offered 1962–63. Eliot and his contemporaries.

295–96 *Studies in the History of English Literary Criticism* (3–3) Shepard
Academic year—evening. Open to undergraduates with the approval of the instructor.

299–300 *Thesis* (3–3) The Staff

AMERICAN LITERATURE

First Group

71–72 *Introduction to American Literature** (3–3) Cole and Staff
Academic year—day and evening; summer 1962. A historical survey. *First half:* from the beginnings to the Civil War. *Second half:* from the Civil War to the present. Prerequisite: English 1 or 1X.

Second Group*

170 *The American Short Story* (3) Coberly
Fall—day. The historical development of the short story in America.

171–72 *Studies in American Literature* (3–3) Lyon
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Major factors in the national cultural tradition as shown by outstanding writers. Prerequisite: English 51–52 or 71–72.

173–74 *Major American Poets* (3–3) Coberly
1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening; summer 1962—English 174 (3). Advanced critical study of significant writers and movements. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

175–76 *American Drama* (3–3) Cole
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—English 176 (3). Historical and critical study of significant plays and forms. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

177–78 *American Fiction* (3–3) Coberly
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Historical and critical study of significant novels and short stories. *First half:* from beginnings through 19th century. *Second half:* the 20th century.

* All students enrolled in curricula leading to Bachelor's degrees in Columbian College who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4:
English 51–52, 71–72, 91–92, Classical Languages 71–72, French 51–52, German 51–52, Slavic Languages 91–92, or Spanish 51–52 is prerequisite to all second-group courses except English 171–72.

179–80 *Proseminar: Readings for American Thought and Civilization Majors* (3–3) — The Staff
Academic year—day and evening. Conferences and group discussions.

THIRD GROUP

271–72 *Seminar in American Thought* (3–3) — Walker
Not offered 1962–63. Intensive consideration of specific periods and themes, primarily literary, in the history of American civilization. Prerequisite: English 171–72 or the equivalent.

277–78 *Studies in American Fiction* (3–3) — Coberly
First half: fall—evening. *Second half:* not offered 1962–63. Prerequisite: English 177–78 or the equivalent. Open to the undergraduate with the approval of the instructor.

279–80 *Thesis* (3–3) — The Staff

RELATED COURSES IN OTHER DEPARTMENTS

Education 136, *Teaching English*
History 151–52, *English History*
Philosophy 111–12, *History of Philosophy*
Speech B, *American Speech for Foreign Students*
Speech 102, *Oral Interpretation of Literature*

GEOGRAPHY*

Professor R. D. Campbell *(Chairman)*
Associate Professor H. W. Westermann†
Associate Professorial Lecturer J. P. Pickard
Assistant Professor J. T. Davis
Associate Joan Barry

Bachelor of Arts with a major in Geography (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including Geography 51 and 52. It is strongly recommended that this curriculum include Biology 1–2‡; Economics 1–2; Geology 1–2; and Sociology and Anthropology 1–2.

Required: in addition to the general requirements, pages 37–42, twenty-four semester hours of Geography beyond first-group courses, including Geography 103–4, 115–16; fifteen semester hours in one or more of the following departments: Botany, Economics, Geology, History, Political Science, Psychology, Sociology and Anthropology; and six semester hours of Mathematics or Statistics.

Master of Arts in the field of Geography.—Prerequisite: the degree of Bachelor of Arts with a major in Geography from this University, or the equivalent.

Required: the general requirements, page 43–45, including Geography 201–2, 205–6, and 299–300.

FIRST GROUP

51 *Introduction to Geography* (3) — The Staff
Fall—day; spring—evening; summer 1962. A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

* The Staff of Instruction here listed is for the academic year 1961–62.
† On sabbatical leave fall semester 1961–62.
‡ An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

52 *World Regions* (3) The Staff
Fall—evening; spring—day; summer 1962. The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.

SECOND GROUP

103–4 *Cartography* (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. Academic year—Saturday morning. Principles of cartographic drafting; elementary map projections; map and graph planning design and construction; uses and interpretation of maps. Prerequisite: Geography 51 and 52. Laboratory fee, $11 a semester.

115–16 *Physical Geography* (3–3) Davis
Academic year: lecture (2 hours), laboratory and field trip (2 hours)—day. Introduction to the earth sciences: form of the earth, grids and time, weather and climate, geomorphic processes and land-forms, soils, vegetation; weather forecasting, map reading.

124 *Land Capabilities* (3)
1963–64 and alternate years. Evaluation of land capabilities based on analysis of locational, physical, economic, and social land characteristics. Principles of site analysis and best use. Systems of measurement of area potential.

125 *Transportation Complexes* (3)
1963–64 and alternate years. A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.

126 *World Economies* (3) Davis
1962–63 and alternate years: fall—day. Description and comparison of differing regional economies—pastoral, agricultural, industrial; patterns of world distribution.

127 *World Population and Settlement* (3) Westermann
1962–63 and alternate years: spring—day. Population composition, structures, and distribution; characteristic world settlement patterns in terms of population organization. Assessment of factors contributing to population pressures, explosions and migrations, urban and rural settlement patterns and trends.

133 *Regional Industrial Structures* (3) Westermann
1962–63 and alternate years: fall—day. The nature of the industrial complex, types and distribution of industry, principles of industrial and economic development planning.

134 *Location of Industry* (3) Westermann
1962–63 and alternate years: spring—day. Structure and development of the major world industries, industrial location requirements, principles of industrial equilibrium.

137 *Industrial Planning for Underdeveloped Areas* (3)
Summer 1962. The appraisal of industrial development potentials in non-industrial areas; the preparation and implementation of industrial development plans; peculiar problems of industrial development in traditional societies; the role of industrialized countries, with particular emphasis on United States responsibilities.

141–42 *Urban Settlement* (3–3)
1963–64 and alternate years. Location, functions, and forms of cities; urban-rural relationships; the urban hierarchy; urban problems and the history of their development; the city of the future.

145 *World Cultural Geography* (3) Campbell
Fall—day. A study of differences in national character structures; modal behavior patterns and personality traits typical of various cultures; difficulties these differences present in interpersonal relations and intercultural communications.

146 *World Political Geography* (3) Campbell
Spring—day. Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.

173–74 *City Planning: Theory and Practice* (3–3)
Academic year—evening. Theories of city functions and structures; evaluation of urban activities, value systems; analysis of contemporary urban problems; optimum designs for future cities; theory and techniques of planning; action techniques; implementation of plans.

181 *United States** (3)
Not offered 1962–63.

183 *Western Europe** (3) Westermann
1962–63 and alternate years: fall—day.

184 *The Mediterranean** (3) Westermann
1962–63 and alternate years: spring—day.

185 *Africa** (3)
Offered 1963–64.

186 *The Middle East** (3)
Offered 1963–64.

191 *Latin America** (3)
1963–64 and alternate years. Davis

194 *Communist China** (3)
Spring—day.

195 *Eastern and Southeastern Asia** (3)
Not offered 1962–63.

196 *The Soviet Union** (3) Westermann
Fall—day.

197 *The Pacific** (3)
Not offered 1962–63.

198 *Australia** (3)
Not offered 1962–63.

THIRD GROUP†

201–2 *Seminar: History and Philosophy of Geography* (3–3) Campbell, Westermann
A year course: credit is not given for the first half until the second half is completed. 1962–63 and alternate years; academic year—evening. A study of the development of geographic thought, from Herodotus to the present; a critical appraisal of the great works of the world's most famous geographers; an attempt to develop a useful, contemporary philosophy of geography.

205–6 *Area Data Collection and Analysis* (3–3)
A year course: credit is not given for the first half until the second half is completed. Lecture (1 hour), laboratory and field (3 hours). 1963–64 and alternate years. Sources of regional information; methods and systems of data collection; quantitative and qualitative methods of analysis; systems of synthesis.

* Regional survey. No prerequisites. For students particularly interested in the study of specific regions, regional courses in the departments of Economics, History, and Political Science are strongly recommended, for example: Economics 185–86, *Economic History and Problems of Latin America*; History 164, *South America since Independence*; and Political Science 177, *Recent Trends in Latin American Politics and Government*.

† Senior major or graduate status is required in all third-group courses.

211–12 *Reading Course in Economic Geography* (3–3)
Not offered 1962–63. The development of economic geography as a systematic approach to regional analysis, the literature of economic geography, research methods.

233–34 *Seminar: Regional and Urban Planning* (3–3) Westermann, Campbell
A year course: credit is not given for the first half until the second half is completed. Academic year—evening. Analysis of the planning function, major problems confronting the planner, contemporary status of planning—its areas of success and failure.

241–42 *Seminar: Place and Culture* (3–3)
1963–64 and alternate years. A study of the culture traits which characterize various ethnic groups and differentiate people-place associations.

251–52 *Seminar: World Problem Areas* (3–3)
Summer 1962—Geography 251 (3). A study of those parts of the world which have become matters of international concern, whether because of their political or social instability, unsound economic development, or aggressive tendencies. An evaluation of the complex of factors which have created the "problems".

295–96 *Research* (3–3) The Staff
Academic year—as arranged.

299–300 *Thesis* (3–3) The Staff

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following courses for students undertaking work toward the degree of Bachelor of Science in Cartography, which is administered by the College of General Studies. For information concerning the degree in Cartography, see the brochure on the subject.

Cartography Program

Geography

51 *Introduction to Geography* (3)
52 *World Regions* (3)
115–16 *Physical Geography* (3–3)
124 *Land Capabilities* (3)
125 *Transportation Complexes* (3)

Cartography

1 *Map Interpretation* (3)
11 *Cartographic Drafting and Descriptive Geometry* (3)
12 *Topographic Surveying* (3)
13 *Higher Surveying* (3)
17–18 *Elementary Photogrammetry* (3–3)
110 *Map Projections* (2)
111 *Map Reproduction* (3)
155 *Elementary Geodesy* (3)
156 *Geodetic Astronomy* (3)
160 *Theory of Errors and Geodetic Adjustments* (3)
191–92 *Map and Chart Construction* (3–3)

Oceanography

101–2 *Introductory Oceanography* (3–3)

GEOLOGY*

Professor Geza Teleki *(Chairman)*
Professorial Lecturers C. L. Christ, Michael Fleischer, H. T. Evans, Jr.
Associate Professor G. V. Carroll
Associate Professorial Lecturers Nicholas Hotton, I. G. Sohn
Lecturer Irving Friedman

Bachelor of Arts or *Bachelor of Science with major in Geology (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32. The following first-group courses must be included: Geology 1–2, 12; Chemistry 11–12; Physics 11, 12; Mathematics 6, 21, or 12.

Required: in addition to the general requirements, pages 37–42, twenty-seven semester hours in Geology beyond first-group courses for the Bachelor of Arts degree, thirty-three for the Bachelor of Science degree.

Master of Arts or *Master of Science in the field of Geology.*—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respctively, with a major in Geology from this University, or the equivalent.

Required: the general requirements, pages 43–45. For graduate work, the foreign language studied should be French, German, or Russian.

First Group

1–2 *Introductory Geology* (3–3) The Staff
Academic year: lecture (2 hours), laboratory and field trip (2 hours)—day. A survey course covering the principles of geology. *First half:* physical geology—materials of the earth's crust, geologic processes. *Second half:* historical geology—geological periods, evolution of life on earth. Laboratory fee, $6 a semester.

12 *Minerals and Rocks* (3) Carroll
Spring: lecture (2 hours), laboratory (3 hours)—day. Introduction to the common minerals and rocks and their environments; identification of minerals by determination of their physical properties and by the use of elementary chemical tests. Prerequisite: Geology 1. Laboratory fee, $8.

Second Group

101 *History of Geological Sciences* (2) Teleki
Not offered 1962–63. Lectures on the development of geological thought and the history of geological and related sciences.

107 *Dynamic Geology* (3) Teleki
Fall: lecture (3 hours), recitation (1 hour)—day. The interrelation of endogene and exogene forces in the processes of sedimentation and vulcanism; geochemical and geophysical aspects of epicontinental and geosynclinal areas. Prerequisite: Geology 1–2, 12; Physics 11, 12.

111–12 *Mineralogy* (3–3) Carroll
A year course: credit is not given for the first half until the second half has been completed (except for chemistry majors who may receive credit for the first half only). Academic year: lecture (2 hours), laboratory (3 hours)—evening. *First half:* morphological crystallography and elementary aspects of optical crystallography with their application to the identification of minerals. *Second half:* optical mineralogy; identification of nonopaque minerals by use of the polarizing microscope. Prerequisite: Geology 1 and 12; Physics 11, 12, or permission of the instructor. Laboratory fee, $10 a semester.

115 *Petrography* (4) Carroll
Fall: lecture (2 hours), laboratory (4 hours)—evening. Megascopic and microscopic identification and classification of common rocks. Prerequisite: Geology 111–12. Laboratory fee, $10.

* The Staff of Instruction here listed is for the academic year 1961–62.

117 *Introduction to Petrology* (3) — Carroll

1963–64 and alternate years: lecture (2 hours), laboratory (3 hours). Lectures on petrogenic theory; laboratory work on the diagnosis of rock genesis by polarizing microscopic determination of mineralogical and textural characteristics. Prerequisite: Geology 115. Laboratory fee, $10.

122 *Structural Geology* (3) — Carroll

Spring: lecture (2 hours), laboratory and field trips as arranged—day. Genetic interpretation of geologic formations on the basis of their structures, with emphasis on applications to geological field work. Prerequisite: Geology 1–2; Physics 11, 12.

123 *Advanced Structural Geology* (3) — The Staff

1963–64 and alternate years: lecture (1 hour), laboratory (4 hours). Introduction to specialized techniques of structural analysis, and to tectonic theory. Prerequisite: Geology 122. Recommended: Mechanical Engineering 10.

128 *Geomorphology* (3) — Teleki

Lecture (2 hours), laboratory and field trips as arranged. 1962–63 and alternate years: spring—day. Nature and evolution of earth forms, interpretation of maps and aerial photographs. Prerequisite: Geology 107 or Geography 115–16.

132 *Economic Geology* (3)

1963–64 and alternate years: lecture (2 hours), laboratory and field trips as arranged. Genesis, distribution, mode of occurrence, and utilization of mineral raw materials. Mining industry in relation to economic life. Prerequisite: Geology 1, 12, 107. Laboratory fee, $10.

151–52 *Invertebrate Paleontology* (3–3) — Teleki

Academic year: lecture (2 hours), laboratory (3 hours), field trips as arranged—day. Taxonomy of fossil invertebrates, development of phyla, paleoecology of invertebrate organisms. Prerequisite: Geology 1–2, 12. Laboratory fee, $8 a semester.

154 *Vertebrate Paleontology* (3) — Hotton

Lecture (2 hours), laboratory or field as arranged. 1962–63 and alternate years: spring—evening. General features of vertebrate morphology and evolution as illustrated by the fossil record; problems of paleoecology and adaptation, where appropriate.

157 *Methods in Paleontology* (3) — Sohn

1963–64 and alternate years. An introduction to the principles and techniques of paleontological research, including the rules of zoological nomenclature. Prerequisite: Geology 151–52.

166 *Stratigraphy* (4) — Teleki

1963–64 and alternate years. Sedimentation, facies, evaluation of stratigraphic boundaries, principles of correlation, applied stratigraphic geology. Prerequisite: Geology 107, 115, 122.

173 *Regional Geology* (3) — Carroll and Staff

1962–63 and alternate years: fall—day. Lecture and map work on the regional distribution of geological formations and structures. This course may be reelected for credit. Prerequisite: Geology 107, 122; Geography 51, or permission of the instructor.

Third Group

205–6 *Seminar* (3–3) — The Staff

Academic year—as arranged. Special topics. Does not repeat itself and may be elected in successive years.

211 *X-ray Crystallography* (3) — Christ

1962–63 and alternate years: fall—evening. The structure of crystals as determined by the X-ray method.

212 *Crystal Chemistry** (3) Evans
1962–63 and alternate years: spring—evening. Chemistry of the solid state. Bonding and coordination and the role of crystalline structure in chemistry and mineralogy.

241 *Geochemistry** (3) Fleischer
1963–64 and alternate years. Principles and theories on the abundance, relationships, and the distribution in the various rock and mineral species.

244 *Isotope Geology** (3) Friedman
1963–64 and alternate years. Investigation of geological phenomena by means of stable and unstable isotopes of elements and of changes in their abundance.

251–52 *Micropaleontology* (4–4) Sohn
Lecture (2 hours), laboratory as arranged. Not offered 1962–63. Identification with the binocular microscope of Ostracoda and other fossil micro-organisms. Micropaleontological techniques, paleontological research methods, taxonomy, and paleoecology. Age determination and correlation of stratigraphic units. Laboratory fee, $12 a semester.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged.

GERMANIC LANGUAGES AND LITERATURES†

Professors W. K. Legner *(Chairman)*, Gretchen Rogers
Associate Professor J. C. King
Assistant Professor H. D. Osterle
Associate Anne Cordero

Bachelor of Arts with a major in Germanic Languages and Literatures (Departmental)—Prerequisite: the Arts and Letters curriculum, page 32.

Required in addition to the general requirements, pages 37–42, German 51–52 plus eighteen semester hours in German courses, above the first group; reasonable proficiency in speaking and writing German; History 39–40 or the equivalent; six semester hours in Philosophy selected with the approval of the adviser. Majors in German are strongly advised to study French.

Master of Arts in Germanic Languages and Literatures.—Prerequisite: a Bachelor of Arts degree with a major in Germanic Languages and Literatures from this University, or the equivalent.

Required: the general requirements, pages 43–45, including a reading knowledge of French and a thesis in the field of German literature or linguistics.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Arts in Education with a teaching field in German (School of Education).—Prerequisite: the Education curriculum, page 34.

Required: the German option and the professional courses listed in the School of Education Catalogue.

First Group

1–2 *First-year German* (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. The essentials of German grammar; translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

* Prerequisite: an adequate background in physics and chemistry, to be determined in conference with the instructor.

† The Staff of Instruction here listed is for the academic year 1961–62.

3–4 *Second-year German* (3–3) — The Staff
A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Selections from modern German prose; continuation and review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: German 1–2 or two years of high school German.

9–10 *German Conversation and Composition* (3–3) — Osterle
Academic year—day. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

47 *Beginning German for Reading Examination Candidates* (0) — The Staff
Fall—evening; spring—evening; summer 1962. Specifically for graduate students with little or no German, who are preparing for reading examinations. No academic credit. Tuition fee, $90.

49 *German Readings for Nonmajor Students* (3) — The Staff
Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or 47, or the equivalent.

51–52 *Introduction to German Literature* (3–3) — Osterle
Academic year—evening. Prerequisite: German 4 or the equivalent.

Second Group

103–4 *Goethe's "Faust"—Parts I and II* (3–3) — Legner
1962–63 and alternate years: academic year—evening.

131–32 *German Literature of the Eighteenth Century* (3–3) — Rogers
1963–64 and alternate years. The age of Lessing, Goethe, and Schiller.

141–42 *German Literature of the Nineteenth Century* (3–3) — King
1963–64 and alternate years. Romanticism, Biedermeier period, Young Germany, Realism.

151–52 *German Literature of the Twentieth Century* (3–3) — Rogers
1962–63 and alternate years: academic year—evening.

179–80 *Advanced Composition for Undergraduate and Graduate Majors* (1–1) — King, Legner
Academic year—as arranged.

Third Group

201–2 *Middle High German* (3–3) — Legner
1963–64 and alternate years.

205–6 *Gothic* (3–3) — Legner
1962–63 and alternate years: academic year—day. Introduction to the comparative study of Germanic languages.

209–10 *Old High German* (3–3) — King
1962–63 and alternate years: academic year—day.

213–14 *Old Norse* (3–3) — Allee
1963–64 and alternate years.

219 *Teaching German in College* (3) — The Staff
Fall—as arranged. Methodology, observation, and apprenticeship in college classes and the language workshop.

221–22 *General Linguistics; Comparative and Historical Indo-European Linguistics* (3–3) King

1963–64 and alternate years. *First half:* introduction to linguistics as a science. *Second half:* introduction to comparative and historical linguistics, with special reference to the Indo-European family.

223–24 *Linguistic Analysis of Modern German* (3–3)

1963–64 and every third year. Treatment of phonetics, phonemics, morphology, and syntax.

225–26 *Seminar: Linguistics* (3–3) King, Allee

1962–63 and every third year: academic year—day. Bibliography, methodology, readings, and research problems.

229 *German Literature of the Fifteenth and Sixteenth Centuries* (3) Legner

1963–64 and alternate years. Transition from chivalric to bourgeois literature. The eras of Humanism and the Reformation as reflected in the principal literary works.

230 *German Literature of the Seventeenth Century* (3) Legner

1963–64 and alternate years. Imitation of foreign models. The literary societies. Preciosity. The beginnings of realism in the novel. Pietism.

231–32 *German Classicism* (3–3) Rogers

1962–63 and alternate years: academic year—day. An advanced study and critique of the literature of the Goethezeit. Prerequisite: German 131–32 or the equivalent.

241–42 *Seminar: German Romanticism* (3–3) King

1962–63 and alternate years: academic year—evening. Treatment of individual writers, groups, motifs, and tendencies.

251–52 *Seminar: Studies in Twentieth Century German Literature* (3–3) Rogers

1963–64 and alternate years. Special projects in fiction, drama, poetry, and criticism.

261–62 *German-English and German-American Literary Relations and Interactions* (3–3) Osterle

Not offered 1962–63. Comparative study of major genres. Appraisal of influences.

271–72 *Seminar: German Literature* (3–3) Osterle

1962–63 and alternate years: academic year—day. Bibliography, methodology, readings, and research problems.

299–300 *Thesis* (3–3) The Staff

Academic year—as arranged. Required of all candidates for the Master's degree in German.

HISTORY*

Professors E. L. Kayser, Wood Gray, H. M. Merriman, R. H. Davison *(Chairman)*
Associate Professors W. C. Davis, R. B. Thompson, R. C. Haskett
Assistant Professor C. J. Herber
Instructor P. P. Hill

Bachelor of Arts with a major in History (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 32, including History 39–40 and 71–72.

Required: the general requirements, pages 37–42, and the grade of "pass" on the History major examination at the end of the senior year.

* The Staff of Instruction here listed is for the academic year 1961–62.

The major, centered on the study of the rise, development, and spread, and the continuing challenges of Western civilization, is attested by a major examination. Under the guidance of an adviser the student will arrange his program in History to attain a balanced coverage of (1) the rise of civilization in Europe to the eve of the French Revolution, (2) the interaction of Western and non-Western culture, especially since the fifteenth century, (3) the historic problems of modern industrial civilization from the beginnings of the Industrial Revolution, and (4) the relations of the major nations of Europe and America in their world setting since the Napoleonic Wars. A six-hour research seminar to give training in fundamental technics is a required part of each major's program, and a proseminar (History 199–200) is offered as a means of integrating the student's understanding of the continuity of Western civilization. For details relating to the administration and content of the major, see the pamphlet on this subject, which is available in the offices of the Dean of Columbian College of Arts and Sciences and the Chairman of the History Department.

Bachelor of Arts with a major in Latin American Civilization (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, see page 32.

Required: the general requirements, pages 37–42, and the grade of "pass" on the Latin American Civilization major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes political and social history, economic development, governmental structures and international relations, and the principal literary works and writers of the Latin American republics. The Department of History provides a proseminar (History 197–98) intended to assist the student in preparing himself for the major examination. For further details, see the pamphlet, which is available in the Office of the Dean of Columbian College of Arts and Sciences.

Master of Arts in the field of History—Prerequisite: the degree of Bachelor of Arts with a major in History from this University, or the equivalent, and the approval of the Department.

Required: the general requirements, pages 43–45. Of the twenty-four semester hours of required second- and third-group courses (exclusive of the thesis), at least six must be in third-group history courses; a maximum of six may be in a closely related field outside the Department of History as approved by the Department. Master's candidates are responsible for arranging with instructors of second-group courses for extra work, in order to receive graduate credit for such courses.

Master of Arts in the field of Latin American Civilization.—Prerequisite: the degree of Bachelor of Arts with a major in Latin American Civilization from this University, or the equivalent.

Required: the general requirements, pages 43–45. Course work and the comprehensive examinations will embrace political and social history, governmental structures and international relations, economic development, and principal literary works of Latin America. The thesis may be written in any one of these four fields. All courses must be approved in advance by the Adviser.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Arts in Education with a teaching field in History (School of Education).—Prerequisite: the Education curriculum, page 34.

Required: the History option and the professional courses listed in the School of Education Catalogue.

First Group

39–40 *The Development of European Civilization* (3–3) Kayser, Herber

Academic year—day and evening; summer 1962. Primarily for freshmen. *First half*: the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half*: from 1715 to the present.

71–72 *The Development of the Civilization of the United States* (3–3) Haskett, Hill

Academic year—day and evening; summer 1962. Primarily for sophomores. *First half*: the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half*: from 1865 to the present.

SECOND GROUP*

109–10 *Ancient History* (3–3) Kayser
Academic year—day. The political, social, and intellectual aspects will be considered. *First half:* the ancient Near East and Greece. *Second half:* Rome.

111–12 *Medieval History* (3–3) Kayser
Not offered 1962–63. The political, social, and intellectual aspects will be considered. *First half:* from the 4th to the 12th century. *Second half:* from the 13th through the 16th century.

130 *Nationalism* (3) Kayser
Summer 1962. The historical evolution of modern nationalism.

131–32 *History of Germany* (3–3) Herber
Academic year—day. The political, social, and cultural development of the German people. *First half:* from the Reformation to 1871. *Second half:* from 1871 to the present.

141–42 *History of France* (3–3) Herber
Not offered 1962–63. A survey of the political, social, and cultural history of France. *First half:* from earliest times to 1815. *Second half:* from 1815 to the present.

143 *History of Old Russia* (3) Thompson
Fall—day. The Slavic and Eurasian roots of Russian society and politics over a thousand-year period, 800–1800.

145–46 *History of Modern Russia* (3–3) Thompson
Academic year—day. The rise and fall of the revolutionary cycle. *First half:* Tsarist Russia in the Golden Age, 1800–1917. *Second half:* Soviet Russia and the politics of empire, since 1917.

147 *Economic History of Europe* (3) Gray
Not offered 1962–63. A survey from ancient times to the present day.

148 *Oversea Expansion of Europe* (3)
Not offered 1962–63. International rivalries and the impact of European civilization in Africa and the Pacific basin since 1500, with emphasis on the 19th and 20th centuries.

149–50 *European Diplomatic History* (3–3) Davison
First half: 1963–64 and alternate years. *Second half:* spring—day and evening. Background of the European state system and of diplomatic practices and relations since the Congress of Vienna, with emphasis on the policies and actions of the great powers and their statesmen. *First half:* to 1878. *Second half:* since 1878.

151–52 *English History* (3–3) Davis
Academic year—day. A general survey of the development of political, social, and economic institutions of lasting significance in the English speaking world. *First half:* to 1689. *Second half:* since 1689.

161 *Ancient Americans* (3) Davis
1962–63 and alternate years: fall—day. A study of the Maya, Aztec, Inca, and other early civilizations of North and South America.

162 *Iberian Background of Latin America* (3) Davis
Alternate spring and summer terms: spring—day; summer 1962. History of Spain and Portugal, with emphasis on developments leading to the rise and decline of the Spanish and Portuguese empires.

163 *Colonial Latin America* (3) Davis
Fall—evening. Political, economic, social, and institutional developments in Spanish and Portuguese America from the conquest through the wars of independence.

* History 39–40 is prerequisite to courses 109 through 152 and 190 through 196; History 71–72, to courses 170 through 184; either History 39–40 or 71–72, to courses 161 through 166.

164 *South America since Independence* (3) **Davis**
Alternate spring and and summer terms: spring—evening; summer 1962. Development of the independent South American states in the 19th and 20th centuries.

166 *Mexico and the Caribbean since Independence* (3) **Davis**
Alternate spring and summer terms: summer 1963; spring 1964. A survey of the republics of Mexico, Central America, and the Caribbean islands.

170 *American Colonial History* (3) **Haskett**
Spring—evening. The settlement of the British colonies, the development of provincial institutions, and the emergence of an American civilization in the 17th and 18th centuries.

171–72 *Social History of the United States* (3–3) **Gray**
Academic year—evening; summer 1962—History 172 (3). Daily life, institutions, intellectual and artistic achievements of the Agrarian Era, 1607–1861; and the Urban-Industrial Era, 1861 to the present time.

173 *Representative Americans* (3) **Gray**
Spring—day; summer 1962. A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform.

174 *Economic History of the United States* (3) **Gray**
Fall—day. Main trends in the development of American agriculture, industry, and trade since 1607, with their Old World backgrounds and in their world setting.

175–76 *Political and Constitutional History of the United States* (3–3) **Haskett**
Academic year—day; summer 1962—History 175 (3). *First half:* to the eve of the Civil War. *Second half:* the Civil War to 1940.

177 *The South* (3) **Gray**
Not offered 1962–63. Rise of the plantation system and slavery; the intersectional conflict; and the problems and progress of the New South.

178 *The West* (3)
Not offered 1962–63. The role of the frontier in American history.

181–82 *Diplomatic History of the United States* (3–3) **Merriman, Hill**
Academic year—day and evening. Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. *First half:* to 1898. *Second half:* since 1898.

183 *Oversea Expansion of the United States* (3) **Merriman**
Spring—day. The political, economic, social, and cultural life of our outlying possessions.

184 *Canada and the United States* (3) **Merriman**
Fall—day. The historical background and main trends in the relationship of the two English-speaking peoples of North America.

190 *History of India* (3) **Thompson**
Not offered 1962–63. The civilization of India and her neighbors from the beginnings to independence.

191–92 *Current History* (1–1) **Kayser**
Academic year—day. Contemporary events in their world setting.

193 *History of the Near East* (3) **Davison**
1962–63 and alternate years: fall 1962—day. The Byzantine, Arab, Persian, and Islamic backgrounds of Near Eastern history; the rise and decline of the Ottoman Empire; the action of European powers in the area; and the Ottoman breakup into the Turkish Republic and other successor states.

195–96 *History of the Far East* (3–3) Thompson
First half: not offered 1962–63. *Second half:* spring—day. *First half:* the civilization of China and Japan from the beginnings to 1600. *Second half:* the modern Far East under the impact of the West since 1600.

197–98 *Proseminar in Latin American Civilization* (3–3) Davis, Robb, Sammons
Academic year—as arranged. Reading course for coordination and review. Open only to majors in Latin American Civilization.

199–200 *Proseminar: Readings for the History Major* (3–3) Thompson
Academic year—evening. Limited to majors in History. Readings and discussions on main trends in the history of Western civilization, including representative selections from the classics of historical literature.

THIRD GROUP*

211–12 *Reading Course in Medieval History* (3–3) Kayser
Academic year—day. Primarily for graduate students.

241–42 *Seminar in Modern European History* (3–3) Herber
Academic year—evening.

243 *Reading Course in Modern European History* (3) Davison
Fall—as arranged. Primarily for graduate students.

246 *Seminar in Eurasian History* (3) Thompson
Spring—evening.

247 *Reading Course in Russian History* (3) Thompson
Fall—evening. Primarily for graduate students.

249 *Seminar in European Diplomatic History* (3) Davison
Fall—day.

261–62 *Seminar in Latin American History* (3–3) Davis
1963–64 and alternate years.

271–72 *Seminar in the Social History of the United States* (3–3) Gray
Academic year—evening.

273–74 *Reading Course in American Economic and Social History* (3–3) Gray
Academic year—as arranged. Primarily for graduate students.

275–76 *Seminar in American Political and Constitutional History* (3–3) Haskett
Academic year—evening.

277–78 *Reading Course in American Political and Constitutional History* (3–3) Haskett
First half: 1962–63 and alternate years—fall as arranged. *Second half:* 1963–64 and alternate years—fall as arranged. Primarily for graduate students.

281–82 *Seminar in the Diplomatic History of the United States* (3–3) Merriman
Academic year—day.

285–86 *Reading Course in American Diplomatic History* (3–3) Merriman
Academic year—evening. Primarily for graduate students.

291–92 *Seminar* (3–3) The Staff
Academic year—as arranged; summer 1962—History 291 (3). Prerequisite: approval of the Department.

* Approval of the instructor is required for registration in each third-group course.

294 *Seminar in the History of the Modern Near East* (3) Davison
Spring—evening.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962. Required of all candidates for the Master's degree specializing in history.

JOURNALISM*

Professor R. P. Schlabach, Jr. *(Chairman)*
Associate Professor R. C. Willson
Lecturers F. L. Dennis, J. V. Hinkel, Louis Robinson, T. R. Smith

Bachelor of Arts with a major in Journalism (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including English 51–52 or 71–72, History 71–72, Political Science 9–10, and Journalism 71–72.
Required:
(1) The general requirements, pages 37–42.
(2) Twenty-four hours of second-group courses in Journalism, as follows: (a) Journalism 111, 196, 198; (b) nine hours chosen from Journalism 121, 133, 137, 144, 151; (c) six hours chosen from Journalism 115, 140, 142, 143, 145.
(3) Twelve hours of second group courses, chosen in consultation with the major adviser, in one other department of Columbian College of Arts and Sciences. Students selecting science may take courses in more than one department.

First Group

71–72 *Journalism in American Society* (3–3) Willson
Academic year—day and evening. Evolution of newspapers and other media in relation to political, social, and economic life; the concept of press freedom; problems of contemporary journalism.

Second Group

111 *Reporting* (3) Schlabach
Fall—day; spring—evening; summer 1962. Instruction and classroom practice in gathering, evaluating, and writing news; emphasis on newspapers, other media considered.

115 *Editing and Make-up* (3) Schlabach
Fall—evening; summer 1962. Editing of news and other material for publication, typography and display; use of pictures and other graphic presentations.

121 *Advanced Reporting: Magazine Feature Articles* (3) Willson
Spring—day; summer 1962. Instruction and practice in writing magazine articles, material for which is obtained through independent investigation.

133 *Advanced Reporting: Community News* (3) Schlabach
Fall—day. Instruction and practice in coverage and writing of local news.

137 *Advanced Reporting: National Affairs* (3)
Not offered 1962–63. Instruction and practice in coverage and writing of federal government news from the point of view of the press association.

140 *Pictorial Journalism* (3) Smith
Spring—evening. Photographic techniques affecting publication, the illustration and the story angle, standards of judgment in selection and use of pictures, captions, editing technique, cropping for effective reproduction.

* The Staff of Instruction here listed is for the academic year 1961–62.

142 *Retail Newspaper Advertising* (3) Robinson
Spring—evening. Retail newspaper advertising management, coordination of newspaper advertising with retail sales patterns, advertising readership, copy preparation, production methods.

143 *Industrial Communications* (3) Willson
Fall—evening. An introduction to the field of corporate journalism. Writing and editing the employee magazine. Preparation of annual reports. Editing stockholder publications, and external house organs.

144 *Advanced Reporting: the Arts and Sciences* (3) Willson
Not offered 1962–63. Instruction and practice in writing articles for publication in such fields as the arts, business and economics, science, and technology.

145 *Principles and Problems of Public Relations* (3) Hinkel
Fall—Saturday morning. Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs.

151 *Editorial Writing* (3) Schlabach
Spring—day. Instruction and practice in writing of editorials on public affairs.

196 *Seminar* (3) Schlabach
Spring—as arranged. For Journalism majors only. Research in areas relating journalism to secondary fields of study.

198 *Law of the Press* (3) Dennis
Fall—Saturday morning. Freedom of the press, censorship, legislative controls, publications as contempt of court, copyright, news gathering agencies, labor law and the newspaper business, law of libel, privileged matter, fair comment on public characters, right of privacy.

MATHEMATICS*

Professors F. E. Johnston, Florence Mears, N. D. Nelson *(Chairman)*, T. P. G. Liverman, N. A. Wiegmann
Professorial Lecturers W. H. Marlow, D. M. Dribin, Thomas Saaty
Associate Professorial Lecturers Joseph Blum, P. A. Devore, J. P. Fennell
Assistant Professors W. A. Smith, R. Z. Vause, Hewitt Kenyon
Lecturers Mabel Morris, A. J. Ziffer, Howard Banilower, Jerome Deutschberger, R. F. Snyder, R. A. Welker

Bachelor of Arts or *Bachelor of Science with a major in Mathematics (Departmental).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 30.
Required: in addition to the general requirements, pages 37–42, twenty-four semester hours of Mathematics of approved second- and third-group courses.

Master of Arts or *Master of Science in the field of Mathematics.*—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Mathematics at this University, or the equivalent.
Required: the general requirements, pages 43–45.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Science in Engineering with an option in Mathematics (School of Engineering).—See the School of Engineering Catalogue.

Bachelor of Arts in Education with a teaching field in Mathematics (School of Education).—Prerequisite: the Education curriculum, page 34.
Required: the Mathematics option and the professional courses listed in the School of Education Catalogue.

* The Staff of Instruction here listed is for the academic year 1961–62.

FIRST GROUP*

3 *College Algebra* (3) — The Staff

Fall—day and evening; spring—day and evening; summer 1962. Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 *Plane Trigonometry* (3) — The Staff

Fall—day and evening; spring—day and evening; summer 1962. Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

9 *General Mathematics I* (3) — The Staff

Fall—day; spring—evening; summer 1962 (offered as Mathematics 2). For those students in the School of Education or others electing Mathematics 9 and 10 as a terminal sequence in mathematics. Propositional logic and truth values; the number system, number bases, arithmetical computation; algebraic functions; topics from plane geometry. Prerequisite: two years of high school mathematics. Not open to students who have had former Mathematics 2.

10 *General Mathematics II* (3) — The Staff

Spring—day. An introduction to matrices and vector spaces; non-Euclidean geometry; introduction to concepts of the calculus. Prerequisite: Mathematics 9 or former 2.

12 *Analytic Geometry* (3) — The Staff

(This course will be offered for the last time summer 1962.)

Summer 1962. Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

21 *Calculus I* (3) — The Staff

Fall—day and evening; spring—day and evening. Elementary concepts of analytic geometry. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite: Mathematics 3 and 6; or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or the equivalent.

22 *Calculus II* (3) — The Staff

Spring—day and evening. Differentiation and integration of transcendental functions and applications; conics; parametric equations; techniques of integration. Prerequisite: Mathematics 21.

23 *Calculus III* (3) — The Staff

Spring—evening. Vector concepts; improper integrals; solid geometry; partial differentiation and applications. Prerequisite: Mathematics 22.

24 *Calculus IV* (3) — The Staff

Offered 1963–64. Multiple integration with application; infinite series; differential equations. Prerequisite: Mathematics 23.

27 *Calculus I and II* (6) — The Staff

The equivalent of Mathematics 21 and 22.

Fall—day and evening; spring—day.

28 *Calculus III and IV* (6) — The Staff

The equivalent of Mathematics 23 and 24.

Spring—day.

* No first-group course in mathematics is available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.

29 *Calculus I* (3) — The Staff

(This course is being offered for the last time summer 1962.)

Summer 1962. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

30 *Calculus II* (3) — The Staff

(This course is being offered for the last time fall semester 1962–63.)

Fall—day and evening; summer 1962. Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.

31 *Calculus III* (3) — The Staff

(This course is being offered for the last time spring semester 1962–63.)

Fall—day and evening; spring—day and evening; summer 1962. Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor).

SECOND GROUP*

101 *Introduction to Mathematical Logic* (3) — Nelson

Fall—evening. Development of propositional and predicate calculi, basic semantic concepts, elementary intuitive set theory, Boolean algebra. Prerequisite: Mathematics 31 or 24 or Philosophy 121.

102 *Fundamental Concepts of Mathematics* (3) — Nelson

Spring—evening. Axiomatic set theory, cardinal and ordinal arithmetic, foundations of the real number system. Prerequisite: Mathematics 101 or permission of the instructor.

106 *Topology for Undergraduates* (3) — Kenyon

1963–64 and alternate years.

111 *Mathematics for Engineers and Physicists I* (3) — The Staff

Fall—day and evening; spring—day and evening; summer 1962. Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 31 or 24.

112 *Mathematics for Engineers and Physicists II* (3) — The Staff

Fall—day and evening; spring—day and evening; summer 1962. Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.

120 *Introduction to Theory of Numbers* (3) — Vause

1963–64 and alternate years.

122 *Introduction to Abstract Algebra* (3) — The Staff

Fall—evening.

123 *Theory of Equations* (3)

Not offered 1962–63.

124 *Introduction to Matrix Theory* (3) — The Staff

Fall—day; spring—evening; summer 1962. Elementary theory of finite vector spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices.

125 *Advanced Algebra* (3)

Not offered 1962–63.

126 *Advanced Analytic Geometry* (3)

Not offered 1962–63.

* Mathematics 31 or 24 is prerequisite to all second-group courses.

132 *Differential Equations* (3)
Not offered 1962–63.

134 *Introduction to Boundary Value Problems* (3) — The Staff
Spring—evening. Prerequisite: Mathematics 111, 132, or 142.

135 *Projective Geometry* (3) — The Staff
Fall—evening.

139 *Advanced Calculus I* (3) — The Staff
Fall—evening; spring—day; summer 1962. Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.

140 *Advanced Calculus II* (3) — Mears
Spring—evening. Vector fields, multiple integrals, line and surface integrals, point set theory, theory of integration, improper integrals. Prerequisite: Mathematics 139.

141 *Introduction to Infinite Series* (3) — Mears
Fall—evening.

142 *Theory of Differential Equations* (3) — ———
Fall—evening. Prerequisite: Mathematics 139.

167 *Fourier Series and Spherical Harmonics* (3)
Not offered 1962–63. Prerequisite: Mathematics 111 or 132.

171 *Vector Analysis* (3) — The Staff
Fall—day; spring—evening.

Third Group

201–2 *Mathematical Logic* (3–3) — Nelson
1963–64 and alternate years.

220 *Theory of Numbers* (3) — Vause
1963–64 and alternate years.

237–38 *Theory of Functions of a Complex Variable* (3–3) — Johnston
A year course: credit is not given for the first half until the second half is completed.
1963–64 and alternate years.

242 *Infinite Series* (3) — Mears
Spring—evening.

243–44 *Numerical Analysis* (3–3) — Marlow
1963–64 and alternate years. Prerequisite: Mathematics 111, 132, or 142.

249 *Ordinary Differential Equations* (3) — ———
Fall—evening.

250 *Integral Equations* (3)
Not offered 1962–63.

251–52 *Theory of Functions of a Real Variable* (3–3) — Liverman
A year course: credit is not given for the first half until the second half is completed.
Academic year—evening.

255 *Differential Geometry* (3)
Not offered 1962–63.

257 *Theory of Groups* (3) — Johnston
Fall—evening.

261 *Generalized Functions and Operational Methods* (3) — Liverman
1963–64 and alternate years. Theory of generalized functions in one variable. Op-

erational calculus of generalized functions. Applications to differential equations and Fourier analysis. Prerequisite: Mathematics 140.

262 *Advanced Operational Methods* (3) Liverman
1963–64 and alternate years. Generalized functions on test spaces of analytic functions. Operational calculus in several variables. Applications to partial differential and convolution equations of applied mathematics. Prerequisite: Mathematics 261

265–66 *Modern Algebra* (3–3) Wiegmann
Academic year—evening. Fundamental concepts of theory of groups, rings, and fields. Theory of finite fields, extension fields, Galois groups, factorization theory in Gaussian domains, and groups with operators.

267 *Topics in Matrix Theory* (3) Wiegmann
Not offered 1962–63. Theory of linear transformations (vector spaces over a division ring), advanced classical theory, matrix representation of groups and rings, special topics as time allows. Prerequisite: Mathematics 124 and an elementary knowledge of groups, rings, and fields.

268 *Calculus of Variations* (3)
Not offered 1962–63.

270 *Tensor Analysis* (3)
Not offered 1962–63.

272 *Hilbert Space* (3)
Spring—evening.

277 *Partial Differential Equations* (3)
Spring—evening.

281–82 *Introduction to Topology* (3–3) Kenyon
Academic year—evening.

295–96 *Reading and Research* (3–3) The Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

MICROBIOLOGY*

Professors R. G. Beachley *(Emeritus)*, A. M. Griffin, Mary Robbins *(Acting Chairman)*, R. C. Parlett
Clinical Professor Murray Grant
Associate Professor Rudolph Hugh
Assistant Professor R. C. Wood
Clinical Instructor A. H. Traum

Special Lecturers L. S. Baron, R. C. Cook, C. W. Emmons, F. B. Gordon, Leon Jacobs, M. C. Leikind, J. D. MacLennan, H. J. Magnuson, W. J. Peeples, C. O. Pierce

Master of Arts or *Master of Science in the field of Microbiology.*—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree, respectively, from this University, or the equivalent, with a major in Biology, Botany, Chemistry, or Zoology. The undergraduate

* The Staff of Instruction here listed is for the academic year 1961–62.

program must include the following courses or the equivalent: Biology 1–2*, Chemistry 11–12, 21, 22, 151–52; Physics 11, 12; Zoology 103–4 (formerly 41–42).

Required: the general requirements, pages 43–45. The thirty semester hours must include (if not presented for admission) Microbiology 112, 249–50, 293–94, 299–300 and Biochemistry 221–22. The remaining courses are to be selected from Microbiology 209, 219–20, 225, 232, 234, 240 and 295–96. The student with much bacteriological background may substitute for credit one or more courses from the following: cytology, genetics, cell physiology, entomology, histology, biostatistics, and protozoology. It is not always possible to arrange courses and research so that the student can be assured of completing all required work in one academic year.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

112 *General Microbiology* (4) — Hugh

Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M. For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications. Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11–12. Laboratory fee, $13.

209 *Medical Microbiology* (1 to 11) — The Staff

Fall: lecture (4 hours), laboratory (10 hours)—as arranged. Bacteria, rickettsiae, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsiae and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, $4.50 for each semester hour of laboratory work.

210 *Fundamentals of Epidemiology and Preventive Medicine* (2) — Grant

Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Microbiology 112 or 209.

219–20 *Advanced Microbiology* (arr.) — Hugh and Staff

Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Microbiology 112 or 209; Chemistry 151–52 or the equivalent; permission of the instructor. Laboratory fee, $4.50 a semester hour.

225 *Bacterial Chemistry and Physiology* (2) — Wood

1963–64 and alternate years: fall—as arranged. A lecture course in those areas of biochemistry peculiar to Class Schizomycetes, including discussion of the use of bacteria in the elucidation of biochemical problems. Prerequisite: Biochemistry 221–22 or the equivalent. A course in microbiology is recommended but is not essential.

232 *Immunological Methods* (3) — The Staff

1962–63 and alternate years: spring—as arranged. Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $11.

234 *Virology* (6) — Robbins

1963–64 and alternate years: spring—as arranged. Study of viruses and rickettsiae. Lectures and laboratory exercises. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $16.

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

240 *Advanced Epidemiology* (3) — The Staff
Spring—as arranged. Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Microbiology 210. Prerequisite: Microbiology 210.

249–50 *Introduction to Medical Research** (3–3) — The Staff
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

293–94 *Staff Seminar* (1–1) — The Staff
Academic year as arranged. For graduate students. Bi-weekly throughout the year.

295–96 *Research in Microbiology* (arr.) — The Staff
Academic year—as arranged.

299–300 *Thesis* (3–3) — The Staff

PATHOLOGY†

Professors T. M. Peery *(Chairman)*, W. R. Duryee *(Research)*
Clinical Professor D. L. Weiss
Associate Professors F. N. Miller, Jr., William Newman, W. L. Marsh
Assistant Professors Lois Platt *(Cytology)*, Alexander Breslow, John Culberson

Special Staff for Demonstrations

Associate Clinical Professors J. S. Howe, E. F. Geever, R. G. Gottschalk
Assistant Clinical Professors R. E. Palmer, W. F. Enos, Cornelia Hoch-Ligeti
Associates L. E. Zimmerman, L. W. Fix, C. B. Cook
Clinical Instructors D. R. Parkinson, I. R. Godwin
Special Lecturers E. B. Helwig, L. C. Johnson

Bachelor of Science in Medical Technology.—Prerequisite: the Science curriculum, page 32, including Biology 1-2‡, Chemistry 11-12, and Microbiology 112.
Required: the general requirements, pages 37–42, including Chemistry 21 and 22 and the following second-group courses offered in the University Hospital: Pathology 115–16, 117–18, and 119–20.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

115–16 *Introduction to Medical Science* (1–1) — Marsh and Staff
Academic year—1 hour a week. For students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.

117–18 *Principles in Medical Technology* (4–4) — Marsh and Staff
Academic year—4 hours a week. For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry, clinical bacteriology, serology, hematology, and clinical microscopy.

119–20 *Medical Technology Laboratory* (10–10) — Marsh and Staff
30 hours a week for 50 weeks. Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: be

* This is an interdepartmental course. The student should register in the department directing his research.
† The Staff of Instruction here listed is for the academic year 1961–62.
‡ An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

matology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.

281 *Problems in Experimental Cellular Pathology* (1) Duryee

Fall—1 hour a week as arranged. For nonmedical graduate students. Also for a limited number of specially qualified medical students on an elective basis. Cytological and biophysical aspects of cellular function in relation to normal and selected pathological conditions.

PHARMACOLOGY*

Professor H. G. Mandel *(Chairman)*
Clinical Professor R. G. Smith
Professorial Lecturer B. B. Brodie
Associate Professor Clarke Davison
Assistant Professors V. H. Cohn, Jr., T. M. Farber, Paul Mazel, Melvin Reich *(Research)*, J. F. Henderson *(Research)*, George Fiala *(Research)*

Master of Arts or *Master of Science in the field of Pharmacology.*—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively. The undergraduate program must include the following courses or the equivalent: Biology 1–2†; Physics 12, 13, 55; Chemistry 11–12, 22, 151–52. Biochemistry 221–22 and Physiology 137 are recommended as the undergraduate electives if the candidate wishes to complete the work for the Master's degree in one year.

Required: the general requirements, pages 43–45, including Biochemistry 221–22; Physiology 137; Pharmacology 249–50, 261, 263, 267–68, 269–70, 299–300. The remaining courses may be selected from Biochemistry 224, 225–26, 232, 241; Physiology 170, 232; Microbiology 112, 209, 225, 230; Pharmacology 279–80.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

249–50 *Introduction to Medical Research*‡ (3–3) The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

261 *Pharmacology* (5) The Staff

Fall—5 hours a week. Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students.

262 *Pharmacology* (1) The Staff

Spring—1 hour a week. Continuation of Pharmacology 261. Pharmacological uses of normal body constituents.

263 *Pharmacology Laboratory* (1) The Staff

Fall—3 hours a week. Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students.

267–68 *Pharmacological Research* (arr.) The Staff

Academic year—as arranged. Primarily for those properly qualified graduate and medical students seeking careers in pharmacology.

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* The Staff of Instruction here listed is for the academic year 1961–62.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.
‡ This is an interdepartmental course. The student should register in the department directing his research.

269–70 *Pharmacology Seminar* (1–1) The Staff
Academic year—2 hours a week. Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students.

279–80 *Mechanism of Drug Action* (1–1) The Staff
Academic year—as arranged. A course to familiarize the student with advanced biochemical, microbiological, and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged. Required of Master of Arts and Master of Science candidates.

PHILOSOPHY*

Professor C. E. Gauss *(Chairman)*
Associate Professor R. H. Schlagel
Lecturer C. H. Pfuntner

Bachelor of Arts with a major in Philosophy (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 32.

Required: in addition to the general requirements, pages 37–42, the grade of "pass" for the Philosophy major examination at the end of the senior year. The coordinated knowledge upon which the student will be examined is schematized under the following two general headings: (1) methodology and theory of knowledge and (2) the history of ideas and social philosophy. The Department of Philosophy provides a proseminar (Philosophy 199–200) intended to assist the student in preparing for the major examination.

Master of Arts in the field of Philosophy.—Prerequisite: an undergraduate major in Philosophy at this University or the equivalent, as attested by the passing of this University's major examination in Philosophy; the following specific courses or the equivalent: Philosophy 111–12, 113, 121–22, and 131.

Required: the general requirements, pages 43–45. As much as possible of the required course work must be in third-group courses. Where second-group courses are elected, students will be required to do more intensive and extensive work than undergraduates. A general written examination in two areas of Philosophy and an oral examination in the student's special field will be required in addition to a Master's thesis of substantial length.

First Group

51–52 *Introduction to Philosophy* (3–3) The Staff
Academic year—day and evening; summer 1962—Philosophy 51 (3). A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.

Second Group

101 *Philosophic Problems in Living Issues* (1) Gauss
Not offered 1962–63. Selected public issues used as the basis for demonstrating the methods and relevance of philosophical analysis. This course may be reelected for credit once only.

111–12 *History of Philosophy* (3–3) Pfuntner
Academic year—evening. The history of western philosophy from early Greece to Kant, seen as the development and modification of the Hellenic cultural pattern.

* The Staff of Instruction here listed is for the academic year 1961–62.

113 *History of Nineteenth and Twentieth Century Philosophy* (3) Pfuntner
Fall—evening. European philosophy from the time of Kant. "Isms" and ideologies at the root of contemporary thought.

121-22 *Logic and Scientific Method* (3–3) Gauss
Academic year—day. *First half:* the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of symbolic logic, the nature of a formal system. *Second half:* general analysis of the methods of investigation and reasoning used in the natural and social sciences, procedures and requirements of definition, classification and sorting, analogical and inductive inference, causal determination, the nature and function of hypothesis, measurement, principles of the theory of probability.

131 *Ethics* (3) Schlagel
Fall—evening. A critical examination of traditional ethical theories from Plato to Ayer. Consideration of the theoretical problems of ethics: the meaning of "good", the nature of ethical judgment, the justification of ethical standards. The course aims at enabling the student to develop his own ethical view as a consequence of his greater understanding of moral phenomena.

142 *Philosophies Men Live by* (3) Schlagel
Spring—evening. Critique of the tenets, methodologies, and presuppositions of current, vital philosophical orientations: Existentialism, Positivism, Pragmatic Naturalism, Theism, Linguistic Analysis. A critique of reason and faith, and the nonrational aspects of man as guiding influences in life.

151 *The Philosophy of Science* (3) Schlagel
Fall—day. Brief history of modern science; problems of the meaning of causality, the justification of induction, theories of probability; the nature of scientific explanation and the status of inferred entities; the nature of a mathematical system. Consideration of the philosophic import of certain scientific theories such as Einstein's theory of relativity, Heisenberg's principle of indeterminacy, and Bohr's principle of complementarity.

152 *Epistemology* (3) Schlagel
Spring—day. The meaning and criteria of truth; the meaning and cognitive significance of common sense, scientific, and religious propositions or beliefs. Study of problems related to perception, verification, universals, *a priori* and *a posteriori* knowledge, the concept of mind.

162 *Aesthetics* (3) Gauss
Spring—day. The nature of aesthetic experience, problems of appreciation and judgment in the arts, and of the theories and process of artistic creation. Emphasis on contemporary arts and criticism.

172 *American Philosophy* (3) Pfuntner
Spring—evening; summer 1962. The philosophies of Peirce, Royce, James, Dewey, and Santayana as representative of American thought.

180 *Philosophy of History* (3) Gauss
Fall—day. Problems of historical knowledge and explanation. Critique of philosophies of history.

193 *Topics in Contemporary Philosophy* (3) Gauss
Summer 1962. Intensive study of one selected topic in contemporary philosophic literature.

199-200 *Proseminar: Readings for the Major* (3–3) Schlagel
Academic year—as arranged. Conferences and group discussions in preparation for field-of-study major examination.

THIRD GROUP

201-2 *Readings and Research* (3–3) The Staff
Academic year—as arranged. Advanced readings and reports. Investigation of special problems.

211 *Seminar in Plato* (3) Gauss
Spring—as arranged. Intensive study of Plato's later dialogues.

212 *Seminar in Aristotle* (3) Schlagel
Not offered 1962–63. Aristotle's logic, metaphysics, and philosophy of science.

216 *Seminar in Kant* (3) Schlagel
Not offered 1962–63. A study of one of Kant's Critiques.

262 *Seminar in Aesthetics* (3) Gauss
Not offered 1962–63. Intensive study in selected problems in the philosophy of art.

299–300 *Thesis* (3–3) The Staff

RELATED COURSES IN OTHER DEPARTMENTS

Classical Languages and Literatures 71–72, *Greek and Roman Backgrounds in Literature* (3–3)

Mathematics 101, *Introduction to Mathematical Logic* (3)

PHYSICS*

Professors G. M. Koehl *(Acting Chairman)*, Lewis Slack†, Herbert Jehle
Associate Professor H. H. Hobbs
Associate Professorial Lecturer H. H. Landon, Jr.
Assistant Professors S. S. Yeandle, Jr., Margaret Montzka, J. P. Hollinger, G. C. Murray *(Research)*
Lecturers J. N. Tevis, DeWitt Fisher, J. M. Harrison, K. F. Oerlein, Herbert Rabin, W. J. Condell, Jr., J. E. Tompkins

Bachelor of Arts or *Bachelor of Science with a major in Physics (Departmental)*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32, including Physics 11, 12, 13, 16; or 11, 14, 15, 16; Chemistry 21; Mathematics 29, 30, and 31 or Mathematics 21, 22, 23, and 24.

Students who started work toward a major in Physics prior to the reorganization of the introductory courses in Physics and Mathematics, which went into effect in the fall of 1959–60, may substitute Physics 5, 6, and 7 for Physics 11, 12, and 13; and Mathematics 19 and 20 for Mathematics 29, 30, and 31 or Mathematics 21, 22, 23, and 24.

Required, both for the Bachelor of Arts degree and the Bachelor of Science degree: the general requirements, pages 37–42, including Mathematics 112 and Physics 101, 105, 106, 113, 102 or 114, and 153, 155, or 156, plus *one* of the following: Physics 118, 123, and 132.

Master of Arts or *Master of Science in the field of Physics*—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Physics at this University, or the equivalent.

Required: the general requirements, pages 43–45, including Mathematics 171 (if not taken earlier) and Physics 201, 202, 219, 255 or 256, and 291–92.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Science in Engineering with an option in Physics (School of Engineering).—See the School of Engineering Catalogue.

Bachelor of Arts in Education with a teaching field in Physics (School of Education).—Prerequisite: the Education curriculum, page 34.

Required: the physics option and the professional courses listed in the School of Education Catalogue.

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* The Staff of Instruction here listed is for the academic year 1961–62.
† On leave of absence spring semester 1961–62.

First Group

For a one-year course offering an introduction to the methods and achievements of physical science, see Chemistry 3–4, page 65.

11 *Introductory Physics* (3) — Koehl and Staff

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; spring—day and evening; summer 1962. An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, $11.

12 *Introductory Physics* (3) — Koehl and Staff

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Spring—day and evening; summer 1962. Mechanics, wave-motion, and sound. Prerequisite: Physics 11. Material fee, $11.

13 *Introductory Physics* (3) — The Staff

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—day and evening; summer 1962. Elementary electricity and magnetism. Prerequisite: Physics 11. Material fee, $11.

14 *General Physics* (3) — The Staff

Lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours). Spring—day and evening. Mechanics, wave-motion, and sound. Prerequisite: Physics 11, Mathematics 29 or 21. Material fee, $11.

15 *General Physics* (3) — Hobbs and Staff

Lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours). Fall—day and evening. Electricity and magnetism. Prerequisite: Physics 14, Mathematics 30 or 22. Material fee, $11.

16 *General Physics* (3) — Hobbs

Lecture (2 hours), conference (1 hour). Spring—day and evening. Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30 or 22, and consent of the instructor.

Second Group

101 *Mechanics* (3) — Jehle

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Statics, elasticity, dynamics of solids and fluids, and gravitation. Prerequisite: Physics 12 or 14, Mathematics 31 or 24.

102 *Heat and Thermodynamics* (3) — Yeandle

Fall—evening. Fundamental concepts, heat transfer, the laws of thermodynamics with applications to physical systems. Prerequisite: Physics 16, Mathematics 31 or 24.

105 *Principles of Electricity* (3) — Hollinger

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Elementary d-c and a-c circuit theory, electric and magnetic fields, dielectric and magnetic materials, motion of charged particles in electric and magnetic fields. Prerequisite: Physics 16, Mathematics 31 or 24.

106 *Optics* (3) — Koehl

1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Geometrical optics; elementary theory of wave motions; interference, diffraction, polarization, and dispersion of light; laws of black-body radiation. Prerequisite: Physics 16, Mathematics 31 or 24.

113 *Atomic Physics* (3) — Hobbs

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Properties of elementary particles, interactions with radiation, atomic structure, optical and X-ray spectra, introduction to wave mechanics. Prerequisite: Physics 16, 101 or 105, or the equivalent, Mathematics 31 or 24.

114 *Statistical Physics* (3) Jehle
Spring—evening. Classical and quantum statistics with emphasis on Maxwell-Boltzmann statistics; applications to kinetic theory of gases, gaseous diffusion, specific heats of gases and solids. Prerequisite: Physics 16, Mathematics 31 or 24, permission of the instructor.

116 *Quantum and Solid State Physics* (3) Hobbs
Spring—day and evening. Primarily for engineers. Prerequisite: Physics 16, Mathematics 111.

118 *Introduction to Solid State Physics* (3) Rabin
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Dielectric and magnetic properties of solids, electron theory of metals, semiconductors, dislocations, and plastic flow. Prerequisite: Physics 113.

123 *Nuclear Physics* (3) Slack
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Structure and stability of atomic nuclei, nuclear transformations and reactions, radiations of nuclei, fission. Prerequisite: Physics 113.

128 *Sound* (3)
1963–64 and alternate years: spring—evening. Production, propagation, and detection of sound waves; vibrations of sounding bodies; acoustic instruments and acoustic measurements. Prerequisite: Physics 16, Mathematics 31 or 24.

132 *Electronics* (3) Hollinger
Lecture (2 hours), laboratory (3 hours). 1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications. Prerequisite: Physics 16 and a course in d-c and a-c circuits in Physics or Engineering. Material fee, $11.

153 *Advanced Laboratory in Atomic Physics* (3) Murray
Spring: Saturday—as arranged. Prerequisite: Physics 16. Material fee, $11.

155 *Advanced Laboratory in Electricity and Magnetism* (3)
Not offered 1962–63. Prerequisite: Physics 105. Material fee, $11.

156 *Advanced Laboratory in Optics* (3) Hobbs
Not offered 1962–63. Prerequisite: Physics 106. Material fee, $11.

181 *Biophysics* (3) Yeandle
Spring—evening. Molecular basis of biophysics, biosynthesis, and reproduction. Molecular and genetic aspects of the effects of radiation. Physiochemical equilibria, steady states, and transients in biological systems; order, disorder, and information theory. Admission by permission of the instructor.

191 *Nuclear Reactors* (3) Landon
Fall—evening. Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16, Mathematics 31 or 24.

THIRD GROUP

201 *Classical Physical Theory* (3) Jehle
Fall—evening. Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171. (Mathematics 171 may be taken concurrently.)

202 *Classical Physical Theory* (3) Jehle
Spring—evening. Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171.

203–4 *Principles of Modern Physics* (3–3)
Academic year—evening. A critical survey of fundamental topics of modern physics including the theory of relativity, thermal radiation and quantum theory, atomic structure and spectra, wave mechanics, interactions present in multielectron atoms, X ray, the nucleus, properties of matter in bulk.

218 *Solid State Physics* (3) Hobbs
Spring—evening. Tensor properties of crystals. Application of quantum mechanics to problems in solid state physics.

219–20 *Quantum Mechanics* (3–3) Jehle
Academic year—evening. Criticism of classical ideas of mechanics and a formulation of quantum mechanical equations; matrix mechanics and its relation to quantum mechanics; application to various problems of atomic, molecular, and nuclear physics. Prerequisite: Physics 113, 201, 202.

221 *Quantum Electrodynamics and Field Theories* (3) Jehle
1962–63 and alternate years: fall—evening. Variation principles. Relativistic wave equations, quantization of fields, interaction between fields. Scattering theory. S matrix and causality. Prerequisite: Physics 219–20.

222 *Elementary Particles* (3) Jehle
1962–63 and alternate years: spring—evening. Scalar, vector, spinor fields, and elementary particles. Symmetry properties and associated conservation laws. Space inversion and parity, time reflection, charge conjugation. Prerequisite: Physics 219–20.

227 *Irreversible Processes* (3) Yeandle
Spring—evening. Extension of thermodynamic concepts to irreversible processes. Discussion of thermodynamic forces and fluxes, and the Onsager reciprocal relations. Review of the statistical mechanical reasons for assuming the postulate of irreversible thermodynamics. Prerequisite: Physics 102, 114; Mathematics 132 or 112.

255–56 *Graduate Laboratory* (4–4) The Staff
First half: fall—day. *Second half:* not offered 1962–63. Individual work on special topics. One semester of this course is required of all Master's candidates in physics. Students electing this course may begin with Physics 255 or 256. Not open to undergraduates. Material fee, $11 a semester.

291–92 *Seminar: Recent Developments in Physics* (1–1) The Staff
Academic year: alternate weeks—Monday evening. Individual investigations of special problems. All students registered for a Master's degree in physics are expected to attend this seminar during residence for the degree, and to take part in its programs. Credit for participation in the seminar work is obtained by registering for this course during the last two semesters of residence; this credit, however, is based upon the seminar work during the entire period of residence.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged. Fees to be arranged.

PHYSIOLOGY*

Professors C. E. Leese, E. M. Renkin *(Chairman)*
Associate Professor F. P. J. Diecke
Assistant Professors Ruth McClintock, C. S. Tidball *(Research)*, Margret Westecker

Master of Arts or *Master of Science in the field of Physiology.*—Undergraduate work should include chemistry and physics. It should be supplemented by further courses in mathematics and science such as calculus, physical and organic chemistry.

* The Staff of Instruction here listed is for the academic year 1961–62.

Required: the general requirements, pages 43–45. In addition to the thesis, the thirty hours of required work should include Physiology 221 or 222, 232, and at least three semester hours of research (Physiology 295 or 296).

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

115 *Introduction to Human Physiology* (3) Leese

Fall—Tues. and Thurs. 8:45 to 10:00 A.M. Lectures on the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of a biological science.

130 *Psycho-Physiology* (2) Leese

Spring—Tues. and Thurs., 5:10 P.M. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.

137 *Vertebrate Physiology* (4) Tidball and Staff

Fall—lecture, Mon., Wed., Fri., 11:10 to 12:00 A.M.; laboratory, Fri., 1:10 to 5 P.M. Fundamental principles of physiology as exemplified in the vertebrates. Prerequisite: Chemistry 11–12 or the equivalent and Physics 11, 12 or the equivalent. Laboratory fee, $18.

170 *General Physiology* (3) Westecker

Spring—Tues. 11:10 to 12:00 A.M., Thurs. 10:10 to 12:00 A.M. Lectures on basic topics in the physiology of cells and tissues. Prerequisite: Physiology 137 and the consent of the instructor.

211–12 *Problems in Physiology* (arr.) Renkin and Staff

Academic year—as arranged. Directed study under the supervision of a staff member. Prerequisite: Physiology 137 or 232 and the consent of the instructor.

221–22 *Physiology Seminar* (1–1) The Staff

Academic year—Fri., 9:00 to 9:50 A.M. Prerequisite: Physiology 137 or 232 and a reading knowledge of French or German.

232 *Advanced Mammalian Physiology* (12) Diecke and Staff

Lecture 6 hours a week, laboratory 12 hours a week. Spring—as arranged. For non-medical graduate students.

249–50 *Introduction to Medical Research** (3–3) The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

259 *Comparative Physiology* (3) Diecke

1964–65 and every third year. Lectures and seminars on topics of current interest in comparative physiology, with emphasis on nonmammalian forms. Prerequisite: Physiology 137 or 232 and the consent of the instructor.

265 *Physiology of Cell Membranes* (3) Renkin

1962–63 and every third year: fall—as arranged. Lectures and seminars on ionic and molecular transport through biological membranes. Prerequisite: Chemistry 111–12, Physics 181 or Physiology 232 and the consent of the instructor.

281 *Biophysics* (3) The Staff

1963–64 and every third year. Lectures and seminars on biological topics which require development along physical lines. Prerequisite: Chemistry 111–12 or Physics 102 and the consent of the instructor.

295–96 *Research* (arr.) The Staff

Academic year—as arranged.

299–300 *Thesis* (3–3) The Staff

* An interdepartmental course. The student should register in the department directing his research.

POLITICAL SCIENCE*

Professors W. R. West *(Emeritus)*, J. W. Brewer *(Chairman)*, W. H. Kraus
Professorial Lecturer F. M. Riddick
Associate Professors H. L. LeBlanc, Benjamin Nimer, H. R. Ludden
Associate Professorial Lecturers William Spencer, R. C. Bain, H. M. Bain
Lecturer C. H. Slayman, Jr.

Bachelor of Arts with a major in Political Science (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including Political Science 9–10.
Required: in addition to the general requirements, pages 37–42, thirty semester hours from the following groups distributed as follows: twelve hours from Group A; six hours from group B; six hours from Group C; and six additional hours from any group or groups. The student will normally complete all six hours of any full-year course which he selects.
Group A: Political Science 111, 112, 117–18, 121–22. Group B: Political Science 171, 172, 181–82. Group C: Political Science 104, 125, 145, 146, 151–52. Group D: 105, 107, 113, 120, 141, 157–58, 177–78, 187–88, 191–92, 194.
Undergraduate students interested in preparing for graduate work in Public Administration will consult the Chairman of the Department of Political Science for modifications of the above requirements.
Bachelor of Arts with a major in Latin American Civilization (Field-of-Study).—See the Department of History, page 87.
Master of Arts in the field of Political Science.—Prerequisite: a Bachelor of Arts degree with a major in Political Science at this University (or the equivalent major elsewhere) with a *B* average (or better) in the major.
Required: the general requirements, pages 43–45. The thirty hours of required work must be approved in advance by the Adviser.
Master of Arts in the field of Latin American Civilization.—See the Department of History, page 87.
Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.
Bachelor of Arts and *Master of Arts in Government in the fields of International Affairs and Public Affairs (School of Government, Business, and International Affairs).*—See the General Catalogue.

First Group

9 *Introduction to Government*† (3) — The Staff
Fall—day; spring—evening; summer 1962. Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

9–10 *Government of the United States*† (3–3) — The Staff
First half: fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening. *First half:* structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.

Second Group†

104 *State and Local Governments* (3) — LeBlanc
Spring—day. State, municipal, and other local governmental forms, operations, and problems, with attention to policy formulation and administration, and to the forces of practical politics.

105 *The Governmental Process of the District of Columbia* (3) — LeBlanc
Not offered 1962–63. Legal structure and political problems of the District of Columbia including restrictions on home rule, Congressional relations, and group politics.

* The Staff of Instruction here listed is for the academic year 1961–62.
† Six hours of first-group Political Science courses are prerequisite to all second-group courses.

107 *Problems in Modern Political Thought* (3) Kraus
Summer 1962. Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.

111 *Introduction to Comparative Government and Politics* (3) Kraus
Fall—day; summer 1962. Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.

112 *Introduction to Comparative Government and Politics* (3) Kraus
Spring—day. Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.

113 *Political Problems of the British Commonwealth of Nations* (3) Kraus
Not offered 1962–63. From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states in Asia and Africa.

117–18 *Political Theory: the Nature and Growth of Political Thought in the West* (3–3) Kraus
Academic year—evening. *First half:* from Classical Antiquity to the Middle Ages; the forging of the western political tradition. *Second half:* from the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, and resistance; liberalism, democracy, and conservatism.

120 *Foundations of American Democracy* (3) Brewer
1962–63 and alternate years: spring—day. Introduction to political thought in the United States from colonial times to the end of the Civil War period.

121–22 *The Constitution of the United States* (3–3) West
Academic year—evening. Judicial power of federal courts in constitutional interpretation. *First half:* emphasis on separation of powers, federal-state relationships, and taxation. *Second half:* emphasis on constitutional protection of civil rights.

125 *Legislative Organization* (3) Riddick
1963–64 and alternate years. A study of Congress: constitutional aspects, legal analysis of make-up, and political organization. Political and parliamentary procedures used in the preparation and enactment of legislation. Not open to students who have credit for former Political Science 124.

141 *The Development of Legal Institutions* (3) Brewer
1963–64 and alternate years. Introduction to historical jurisprudence: primary attention to the origins of the Roman Law of Continental Europe and of the Anglo-Saxon Common Law.

145 *Political Parties and Politics* (3) LeBlanc
Fall—evening; summer 1962. Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress.

146 *Political Pressures and Public Reactions* (3) Ludden
Spring—evening. Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.

151–52 *Public Administration* (3–3) LeBlanc
First half: fall—day; summer 1962. *Second half:* not offered 1962–63. Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.

157–58 *Current Problems in Domestic Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary issues in interna. American politics with discussion of problems and policies.

166 *Field Work in Government* (3) LeBlanc
Fall—as arranged; spring—as arranged. Practical training in the operation of the Federal Government, based on experience through assignment to selected government offices. Students will have an opportunity to observe and participate in government in the Washington area. Open only to students in the Public Affairs curriculum, School of Government, Business, and International Affairs.

171 *International Politics* (3) Ludden, Nimer
Fall—day and evening; summer 1962. Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.

172 *International Organization: the United Nations* (3) Ludden
Spring—day and evening; summer 1962. Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations.

177 *Recent Trends in Latin American Politics and Government* (3) Davis
Fall—day. Types of government, recent developments, and current political conditions in each of the twenty Latin American republics.

178 *International Politics in the Western Hemisphere* (3) Davis
Spring—day. Political relations of the American Republics in the 19th and 20th centuries, the development of Pan Americanism and the Organization of American States.

181–82 *International Law* (3–3) Brewer
Academic year—day and evening; summer 1962—Political Science 181 (3). Survey of the public law of nations with emphasis on the law of peace. Neutrality and the so-called law of war receive attention in the second semester.

187–88 *Current Problems in International Politics* (1–1) Slayman
Academic year—evening. Analysis of outstanding contemporary international issues with discussion of problems and policies.

191 *Politics of the Middle East* (3) Nimer
Fall—day. Domestic and international politics of Turkey, Iran, Israel, and the Eastern Arab States and Principalities. Special attention to the specifically regional aspect of the foreign policies of these countries.

192 *Politics of North and Central Africa* (3) Nimer
Spring—day. Domestic and international politics of the Western Arab States, Ethiopia, Somalia, Liberia, and the newly independent states of former British, French, and Belgian Africa. Special attention to the specifically regional aspect of the foreign policies of these countries.

194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3)
Spring—evening. Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.

197 *Proseminar in International Affairs* (3) Nimer
Fall—evening; spring—day; summer 1962. Reading and discussion course for coordination and review. Primarily for seniors in the International Affairs major.

THIRD GROUP

205–6 *The Federal Executive* (3–3) R. C. Bain
Academic year—evening. *First half:* nomination and election of the U. S. President, his constitutional and political powers; the cabinet and the Executive Office of the President; the relation of the President to the executive and legislative branches of the government. *Second half:* the practical politics of the presidency, presidential policy leadership and control, the President as party head and as moulder of public opinion.

209–10 *Seminar: the Federal Government of the United States* (3–3)
1963–64 and alternate years. Advanced research emphasizing legislative problems of Congress and relations of Congress with the Administration.

212 *Seminar: Comparative Government and Politics* (3) Kraus
Spring—evening. Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem. Attention will be directed to questions of method.

213 *Readings in Comparative Government and Politics* (3) Kraus
Fall—evening; summer 1962. Readings and group discussions on methodological questions, comparative political and administrative institutions with attention to legislatures, the changing role of the executive, political parties, constitutional and totalitarian approaches to public management and public service, the role of the military, etc.

217 *Seminar: Topics in Political Theory* (3) Kraus
Fall—evening. Research and discussion on problems of modern political and constitutional theory, theoretical aspects of representative government, democracy, socialism, and totalitarianism. Each semester is devoted to a separately announced topic, such as socialism and communism, theories of resistance and revolution, problems of democratic theory.

220 *Reading Course in Political Theory* (3) Kraus
Spring—evening. Readings and group discussions, principally on modern political and constitutional theory since the 17th and 18th centuries.

221–22 *Seminar: The Constitution of the United States* (3–3) West
1962–63 and alternate years: academic year—evening. Selected topics in the development of the law of the Constitution. Primary attention will be given to the development of "due process of law" in the courts.

235 *Metropolitan Problems* (3) H. M. Bain
Fall—evening. Growth of American cities and changing land use patterns in relation to internal transportation systems. The respective roles of the private automobile and of public transportation. The problems of financing and administering public transportation systems under public and private ownership.

245–46 *The American Political Process: Political Parties and Interest Groups* (3–3) LeBlanc
Academic year—evening. *First half:* readings and group discussions on the nature and functions of political parties and the role and techniques of political interest groups. *Second half:* seminar on selected topics of American politics requiring the use of basic research materials.

271–72 *Problems in International Politics and Organization* (3–3) Ludden
Academic year—day. A seminar to develop techniques of research in recent international affairs and to examine developments in international politics and organizations.

273 *Public Opinion and Foreign Policy* (3) Ludden
Fall—evening. Development, organization, and operation of international information programs by major world powers. Public opinion in the United States influencing the formation and conduct of foreign policy.

274 *Methods and Objectives of Foreign Policy* (3) Davis
Spring—evening. Examination of the objectives of foreign policies of the major powers, with attention to political, economic, and military methods used to pursue these objectives.

277 *Seminar: Latin American Government* (3)
Fall—evening; summer 1962. Analysis of the political structures of selected Latin American republics. Two comparable governments studied each year.

278 *Seminar: Latin American Political Philosophy* (3) Davis
Spring—evening. Research in political personalities and philosophies of 19th and 20th century Latin America.

279 *Reading Course in International Affairs* (3) ———
Fall—evening; summer 1962. Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization.

281–82 *Seminar: International Law and Relations* (3–3) Brewer
First half: fall—evening; summer 1962. *Second half:* not offered 1962–63. Research in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications.

292 *International Politics and Government in the Middle East* (3) Nimer
Spring—evening. Research and analysis of the international relations and major political problems of the Arab world and adjacent areas.

293–94 *Seminar: International Politics and Government in the Pacific Area* (3–3) ———
Academic year—evening. Research and analysis of the major patterns of development in internal and international politics of the area, with advanced study of the governmental institutions of the Far East.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses announced above, the University offers political science courses listed below for students in the following special programs: Air Force Advanced Management Program, Army War College Program, National War College Program.

283 *Topics in International Law* (3) Brewer
A consideration of theory, problems, and cases in the public law of nations, including the law of peace and the law of war.

285 *Diplomacy Since World War II* (3) Jordan
Recent changes in diplomatic procedures and objectives as compared with those of earlier periods.

287 *American Military Policy* (3) Stanley
Examination of the nature of military policy and its relation to domestic and foreign policy, the historical element, organization within the military establishment for policy making.

297 *Directed Individual Readings in Political Science* (arr.) The Staff
Bibliography and associated conferences on selected topics for advanced students.

PSYCHOLOGY*

Professors Mitchell Dreese†, Thelma Hunt *(Chairman)*, D. C. Faith
Professorial Lecturers H. F. Hubbard, Margaret Ives, G. H. Mowbray
Associate Professors C. E. Tuthill, W. E. Caldwell, J. N. Mosel, R. D. Walk, Eva Johnson, C. W. Hill, Virginia Kirkbride, L. E. Schlesinger *(Research)*

*The Staff of Instruction here listed is for the academic year 1961–62.
†On leave of absence 1961–62.

Associate Professorial Lecturer J. G. Colmen
Assistant Professors R. E. Nolan, Lila Ghent *(Research)*, Jacqueline Goodnow *(Research)*
Lecturer C. J. Lindley
Associate Janet Johnson

Bachelor of Arts with a major in Psychology (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including Psychology 1, and 4 or 22 or 29.

The general requirements for the degree are stated on pages 37–42. The sixty required semester hours must include twenty-seven hours in Psychology in addition to those taken as prerequisites, including Psychology 98, 118, 131, 151, 191, and 196; and Statistics 53 or 104.

Master of Arts* or *Master of Science in the field of Psychology.—Prerequisite: the degree of Bachelor of Arts with a major in Psychology at this University, or the equivalent. Required: the general requirements, pages 43–45. Of the twenty four required semester hours (exclusive of the thesis), a minimum of eighteen must be in third-group courses; a minimum of twelve must be in psychology including Psychology 201 and 202; twelve may be in related fields approved by the Department.

Master's programs are available in the following fields of concentration: (1) tests and measurements, (2) counseling and guidance, (3) clinical-abnormal, (4) social, (5) personnel, (6) experimental, (7) personality, and (8) experimental comparative. For detailed requirements consult the Chairman of the Department.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Master of Arts in Government or *Master of Business Administration in the field of Personnel Administration including options in Counseling and Psychometrics (School of Government, Business, and International Affairs).*—See the General Catalogue.

Master of Arts in Education in the fields of Employee Training and of Guidance (School of Education).—Prerequisite: a Bachelor's degree from an accredited institution and two years of successful teaching experience. See the School of Education Catalogue.

First Group

1 *General Psychology** (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. The fundamental principles underlying human behavior.

4 *Psychology of Adjustment* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.

22 *Introduction to Educational Psychology* (3) — Dreese, Faith
Fall—evening; spring—day. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3) — Johnson
Fall—day; spring—evening; summer 1962. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

98 *Abnormal Psychology* (3) — Nolan, Hunt
Fall—day and evening; spring—day; summer 1962. The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.

Second Group†

112 *Adolescent Psychology* (3) — Johnson
Fall—day. Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.

* Psychology 1 is prerequisite to all other courses in Psychology.
† Six credits in first-group courses are prerequisite to all second-group courses.

115 *Psychology and Language and Communication* (3) Mosél
Fall—day. An introduction to psycholinguistics and verbal behavior. Information theory, the measurement of meaning, cultural and linguistic structures in the perception and learning of language.

118 *Physiological Psychology* (3) Hill
Fall—evening; spring—day; summer 1962. Structure, function, and phylogeny of receptors, nervous system, and effectors as mediators of behavior, including drives, learning, and emotions.

121 *Educational Psychology* (3)
Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.

129 *Introduction to Counseling and Guidance* (3) Dreese
Fall—evening; summer 1962. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.

131 *Psychological Tests* (3) Hunt
Fall—evening; spring—day; summer 1962. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $7.

141 *Leadership, Group Behavior, and Student Life* (3) Faith
Fall—day. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.

144 *Personnel Psychology* (3) Hubbard, Mosél
Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.

146 *Interpersonal Relations* (3) Schlesinger
Fall—day. The psychosocial processes involved in social interaction. The perception of other persons, social communication, small group processes, group problem-solving and change.

148 *Psychology of Advertising and Consumer Behavior* (3) Mosél
1963–64 and alternate years. The motivational and social processes in economic behavior. Consideration of current techniques and findings in motivational research. Evaluation of the effectiveness of mass media, public relations programs, and strategies of persuasion.

151 *Social Psychology* (3) Tuthill
Fall—evening; spring—day; summer 1962. The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.

156 *Psychology of Propaganda and Public Opinion* (3) Tuthill
Spring—evening; summer 1962. The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.

161 *Comparative Psychology* (3) Caldwell
Spring—day. A lecture course in animal psychology. Covers psychological processes in infrahuman organisms, evolution of behavior, the place of animal experimentation and research in psychology.

162 *Experimental Comparative Psychology* (3) Caldwell
Fall—as arranged; spring—as arranged. Opportunity for individual psychological experimentation using lower animals as subjects. Offered on independent study plan. Prerequisite: Psychology 161 and permission of the instructor.

191 *Experimental Psychology* (3) Hill, Walk
Fall—day and evening; spring—day and evening. The application of experimental methods to various psychological problems. Prerequisite: 6 credits in psychology and an elementary course in statistics. Material fee, $10.

192 *Problems in Experimental Psychology* (3) Hill, Walk
Fall—as arranged; spring—as arranged. Opportunity for work on individual experimental projects. Prerequisite: Psychology 191 and permission of the instructor.

193–94 *Readings in Psychology* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 193 (3). Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality-point index of 3.00 or higher. Admission by special permission of the instructor.

196 *History and Systems of Psychology* (3) Caldwell
Fall—day; spring—evening; summer 1962. A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology.

Third Group*

201 *Seminar: Advanced General Psychology* (3) Hill
Fall—day; spring—evening. General review of the field for graduate students with an intensive study of selected problems. Required in all graduate programs.

202 *Psychological Research Methods and Procedures* (3) Walk
Fall—evening; spring—day; summer 1962. Required in all graduate programs. Prerequisites: Experimental Psychology and an elementary course in statistics.

207–8 *Readings in Psychology for Graduate Students* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 207 (3). Supervised readings with conferences on specified topics in psychology. Open only to students who have had course work in the field of the readings.

209 *Seminar: Psychology of Motivation* (3) Caldwell
Fall—evening. A consideration of various theoretical approaches to the psychology of motivation and systematic concepts and experimental findings deriving from each approach.

212 *Personality Evaluation by Projective Techniques* (3) Nolan, Ives
Fall—day; spring—evening. Primary emphasis upon administration and scoring of the Rorschach Test. Prerequisite: Psychology 233.

213 *Clinical Psychometrics* (3) Ives
Spring—evening. A study of the clinical applications of nonprojective tests. Prerequisite: Psychology 233.

215 *Advanced Study of Projective Techniques* (3) Nolan, Ives
Fall—evening; spring—day. Primary emphasis upon interpretation of the Rorschach Test. Prerequisite: Psychology 212.

217 *Seminar: Developmental Psychology* (3) Ghent
Spring—day.

218 *Seminar: Clinical Psychology—Psychopathology* (3) Nolan
Fall—evening; summer 1962. Covers basic etiological factors in behavioral and psychological deviations and disorders.

219 *Seminar: Clinical Psychology—Psychotherapy* (3) Nolan
Spring—day. Covers theoretical principles underlying psychotherapy, techniques and procedures, and problems of evaluation.

* Open only to graduate students, except by special permission of Instructor and Chairman of the Department.

220 *Seminar: Abnormal Psychology* (3) Hunt
Fall—day; spring—evening. An intensive study of selected problems in the field of abnormal psychology.

223 *Seminar: Learning* (3) Walk
Fall—day. Covers research and theory in the psychology of learning.

225 *Seminar: Mental Hygiene* (3) Lindley
Fall—evening; spring—day. A study of mental health problems with special attention to needs of counselors.

226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3) Johnson
Spring—evening. A survey of behavior and personality disorders.

227 *Seminar: Counseling and Guidance* (3) Dreese
Spring—evening. Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.

228 *Seminar: Techniques of Counseling* (3) Dreese
Fall—evening; spring—evening; summer 1962. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Psychology 229 and 236. In exceptional cases Psychology 229 or 236 may be taken concurrently with 228.

229 *Seminar: Occupational and Educational Information* (3) ————, Faith
Fall—evening; spring—evening. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.

231 *Test Construction* (3) Mosél
Fall—evening. The principles underlying test construction: statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.

233 *Individual Psychological Testing* (3) Johnson
Fall—day; spring—day. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, $7.

234 *Seminar: Test Theory* (3) Mosél
1962–63 and alternate years: fall—evening. Development of the axiomatic-deductive theory underlying the major notions in the construction, evaluation, and application of psychological tests.

235 *Seminar: Psychological Measurement* (3) Hunt
Spring—evening. Advanced instruction in the use and interpretation of psychological tests, with emphasis upon group tests; survey of recent research in psychological measurement. Prerequisite: a course in psychological or educational measurement.

236 *Seminar: Analysis of the Individual for Purposes of Counseling* (3) Faith, ————
Fall—evening; spring—evening; summer 1962. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

244 *Seminar: Job Analysis and Evaluation* (3) Mosél
Summer 1962.

245 *Seminar: Employee Motivation and Morale* (3) Mosél
Spring—evening. An analysis of organizational behavior, especially with regard to motivation and productivity. The implications of recent research on employee attitudes, the primary group, the effects of various patterns of supervisory leadership, the role of formal and informal organization, and job design.

246 *Seminar: Personnel Measurement Techniques* (3) Mosél
Fall—evening. Detailed consideration of the techniques of personnel selection and performance evaluation. The use of employment tests, personal data, assessment interviews, and performance ratings.

249 *Seminar: Human Engineering* (3) Mowbray
Fall—evening. Application of findings and methods of experimental psychology to design and operation of equipment and man-machine systems. Relation of capacities of the operator to information display systems, control mechanisms, work environment, and work methods.

251 *Seminar: Advanced Social Psychology* (3) Tuthill
Fall—evening. Current research and theory in social psychology; group dynamics, ego-involvements, action research, and social interaction theory.

254 *Seminar: Group Dynamics* (3) Tuthill
1963–64 and alternate years. The experimental study of small groups; autocratic and democratic group climates; interaction process analysis; Lewin's field-theoretical approach to individual and group processes.

255 *Seminar: Techniques of Opinion and Attitude Measurements* (3) Tuthill
1962–63 and alternate years: spring—evening. Methods of attitude measurement (interviews, questionnaires, scales, polls) as currently used by private and governmental investigators. The place of attitude studies in schools, industry, government, etc.

258 *Applied Social Psychology* (3) Mosél
Spring—evening. The development of personality, personality adjustment, nature of communication and interaction; structure and functioning of groups, group dynamics, opinion and attitude formation, and opinion and attitude measurement. Classroom activity supplemented by practical observations and projects. Open only to graduate students in hospital administration, engineering administration, and other graduate administrative programs.

261 *Seminar: International Communication* (3) Mosél
1963–64 and alternate years. The communication process, problems in mass communication, measuring and modifying opinions and attitudes, principles of persuasion, psychological warfare.

262 *Dynamics of Social Change* (3) Lippitt
Spring—evening. Current research and theory related to the process of social change. Basic principles of planned change will be explored in connection with individual, group, organization, community, and cultural change. Human factors in the change process will be emphasized.

264 *Sensitivity Training: Human Relations Laboratory Course* (3) Lippitt
Fall—evening; spring—evening. A sensitivity learning experience in human relations. The course is built around an unstructured group experience with opportunities for individual feedback, experimentation, and practice. The goal of the course is the development of self insight, situational sensitivity, and diagnostic skills in human relations. Prerequisite: 9 semester hours in psychology or sociology.

265 *Theory and Design in Human Relations Training* (3) Lippitt
Fall—day. Designed for those interested or involved in conducting human relations training. Theories of learning are reviewed. The laboratory approach to human relations training is explored in depth. Practice in designing, developing training skills, and evaluation of training are covered. Prerequisite: Psychology 264 or a human relations laboratory learning experience.

267 *Theories of Organization* (3) Schlesinger
Spring—day. Theory and research in formal organizations. Classical, human relations, and information processing theories of organizations. The effects of organizational design on communication processes, leadership, decision-making, intertroup relations, small group formation, status hierarchies, productivity, motivation, and morale. Open to graduate students in psychology and graduate administrative programs.

272 *Seminar: Theories of Personality* (3) Caldwell
Fall—evening. A survey of the various theories of personality, with emphasis upon theoretical problems and methodology in the field of personality study.

281–82 *Practicum in Counseling* (3–3) The Staff
Academic year—as arranged; summer 1962—Psychology 281 (3). Supervised practical instruction in agencies doing counseling. Prerequisite: graduate work in counseling. Admission by permission of the Chairman of the Department.

283–84 *Practicum in Clinical Psychology* (3–3) Nolan
Academic year—as arranged; summer 1962—Psychology 283 (3). Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psychology 212 and 233. Admission by permission of the Chairman of the Department.

289–90 *Seminar: Current Research and Theory in Psychology* (3–3) ———
Academic year—evening; summer 1962—Psychology 289 (3). A review and discussion of contemporary research and theory in some advanced and specialized field of psychological study, by leaders in the field. The specific topic and instructor for each semester will be announced in advance of the beginning of the semester.

292 *Seminar: Perception* (3) Walk
Spring—evening. Study of current research and theory in the experimental psychology of perception.

295–96 *Research in Psychology* (arr.) The Staff
Academic year—as arranged; summer 1962. Individual research by student, carried out under supervision of staff member.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

Course Offered in Special Program

In addition to the regular courses announced above the University offers the following course, which is available only to students enrolled in the Engineering Administration program.

145 *Principles of Human Relations* (3) Schlesinger
Fall—evening; spring—evening; summer 1962.

RELIGION*

Professors J. R. Sizoo, C. E. Olmstead *(Chairman)*
Professorial Lecturers T. A. Stone, R. E. McNally
Associate Professor R. G. Jones
Associate Professorial Lecturer C. D. Kean
Lecturers A. B. Seidman, E. W. Seaman

*The Staff of Instruction here listed is for the academic year 1961–62.

Bachelor of Arts with a major in Religion (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including Religion 9, 10, and 59–60. Required: the general requirements, pages 37–42, including a minimum of eighteen semester hours in religion beyond first-group courses.

Master of Arts in the field of Religion.—Prerequisite: an undergraduate major in Religion at this University or the equivalent.

Required: the general requirements, pages 43–45. Of the twenty-four semester hours of required courses (exclusive of the thesis), at least twelve must be in third group religion courses; a maximum of nine may be in a closely related field outside the Department of Religion as approved by the Department.

Master of Arts in the field of Religious Education.—Prerequisite: an undergraduate major in Religion at this University or the equivalent; the following specific courses or the equivalent: Education 108; Psychology 1, 22, and 29; Sociology and Anthropology 1; Speech 1 or 11.

Required: the general requirements, pages 43–45. Of the twenty-four semester hours of required courses (exclusive of the thesis), at least six must be in third-group religion courses; a maximum of twelve may be in a closely related field outside the Department of Religion as approved by the Department.

Doctor of Philosophy in the field of the History of Religion in the United States (Graduate Council).—See the pamphlet on the Graduate Council.

First Group

9 *The Old Testament* (3) Jones and Staff

Fall—day and evening; summer 1962. A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities.

10 *The New Testament* (3) Jones and Staff

Spring—day and evening; summer 1962. A study of the literature of the New Testament from the standpoint of occasion, purpose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles.

59–60 *History of Religion* (3–3) Olmstead and Staff

First half: fall—day and evening. *Second half:* spring—day and evening; summer 1962. *First half:* primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. *Second half:* Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status.

Second Group

103 *The Prophets, Their Times and Their Message* (3) Jones

Fall—day. The development of prophetism in the Old Testament; cultural, economic, psychological, and religious factors in the movement; elements of lasting value in the prophetic teaching. A few of the prophets will be selected for particular study.

104 *The Life and Thought of Jesus* (3) Kean

Spring—day. A comprehensive study of the life and teachings of Jesus as they relate to problems of belief, standards of value, and patterns of life; the significance of the message of Jesus for our own times.

105 *The Life and Thought of Paul* (3) Kean

Fall—evening. Greek and Hebrew backgrounds of early Christianity, the Roman world of the first century, religious and social conditions affecting the spread of Christianity, the life and journeys of Paul, Paul's teaching and presentation of the Christian faith, the place of the Pauline epistles in the New Testament.

121 *Problems of Western Religious Thought* (3) Olmstead

Fall—day. The nature of religious truth and experience; the existence, character, and activity of God; the predicament of modern man; the problem of evil and suffering; eternal life; science and religion; the meaning of worship; religious views of history.

122 *Christian Ethics and Modern Society* (3) Jones
Spring—day. The nature and principles of the Christian life as developed by the Christian community; problems of personal conduct; the application of the Christian standard to family, social, and economic institutions.

131 *History of Christianity to the Reformation* (3) Olmstead, McNally
Fall—day. The rise and expansion of Christianity, the development of Christian thought, the evolution of church organization and worship, the Renaissance and pre-Reformation dissent.

132 *History of Modern Christianity* (3) Olmstead, McNally
Spring—day. The origin and development of Protestantism; the Roman Catholic revival; the status of the Eastern churches; doctrines, worship, expansion, church and state, and relation to modern thought and life.

135 *History of Judaism to the Talmud* (3) Seaman
Fall—day. A study of the history and religious thought of the Jewish people from the Maccabean revolt to the compilation of the Talmud.

136 *History of Medieval and Modern Judaism* (3) Seaman
Spring—day. A study of the history and religious thought of the Jewish people from the compilation of the Talmud to the present.

141–42 *Religious Education* (3–3) Stone
Not offered 1962–63. Principles and practices of religious education in the home, church, and community; basic educational procedures and special techniques; organization and administration of religious education.

172 *Religion in American Culture* (3) Olmstead
Spring—evening; summer 1962. Growth of religious bodies and institutions in American culture, the heritage of religious freedom and diversity, religion and literature, revivalism and education, science and religious thought, divisions and cooperative movements in religion.

Third Group

209–10 *Seminar in Biblical Literature* (3–3) Jones
Academic year—evening. Study of the main problems of Biblical literary and historical criticism.

211–12 *Seminar in Biblical Thought* (3–3) Jones
Not offered 1962–63. Study of the Biblical interpretation of history and reality and its relation to Biblical beliefs about God, man, and the world.

231–32 *Seminar in Early and Medieval Christianity* (3–3) Olmstead, Jones
Academic year—evening. An advanced study of the development of Christian thought from primitive beginnings to the Reformation.

234 *Seminar in Modern Religious Thought* (3) Olmstead
Not offered 1962–63. Analysis of developments in western religious thought from the 18th century to the present.

241–42 *Seminar in Religious Education* (3–3)
Not offered 1962–63. Advanced course dealing with some of the major problems in the practice of religious education.

271 *Seminar in American Religious History to 1830* (3) Olmstead
Not offered 1962–63. Study of religious thought and life during the colonial and early national period.

273 *Seminar in American Religious History since 1830* (3) Olmstead
Fall—as arranged. Analysis of modern and contemporary trends in American religious thought.

291–92 *Readings and Research* (3–3) The Staff
Academic year—as arranged; summer 1962. Investigation of special problems in the history of religion.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962.

RELATED COURSES IN OTHER DEPARTMENTS

Art 115, *Christian Iconography* (3)
Classical Languages and Literatures 11–12, *First-year Greek* (3–3)
Classical Languages and Literatures 13–14, *Second-year Greek* (3–3)
Classical Languages and Literatures 21–22, *First-year Classical Hebrew* (3–3)
Classical Languages and Literatures 23–24, *Second-year Classical Hebrew* (3–3)

ROMANCE LANGUAGES AND LITERATURES*

Professors A. T. Deibert *(Emeritus)*, G. E. McSpadden, L. A. Vignéras
Associate Professors Rafael Supervía, J. W. Robb, W. G. Clubb *(Chairman)*, C. Y. Meade, G. E. Mazzeo
Assistant Professors J. L. Metivier, Jr., Carlos Lozano, J. A. Frey
Instructors Elizabeth Neyman, Gérard Huvé, Eulogia Llansa
Language Workshops Supervisor R. T. Tyser

Courses are generally conducted in the language concerned. For General Courses in Romance Languages and Literatures (French, Italian, Portuguese, Spanish) see pages 126–27.

Bachelor of Arts with majors in (1) *French Language and Literature*, (2) *Spanish-American Literature*, and (3) *Spanish Language and Literature (Field-of-Study).*—Prerequisite: the Arts and Letters curriculum, page 32.

Required: the general requirements, pages 37–42 and the grade "pass" on the major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes the political, social, and cultural backgrounds of the literature studied; the writers and their works. Proficiency in the spoken and written language is required. Majors in Romance Languages are strongly advised to study Latin, a knowledge of which is generally required for graduate work. The Department provides a proseminar in each of the major fields intended to assist the student in his preparation for the major examination.

Master of Arts in the fields of (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature.*—Prerequisite: the degree of Bachelor of Arts in the appropriate field from this University, or the equivalent.

Required: the general requirements, pages 43–45. The thirty hours of required work must include a thesis, for which six hours of credit are allotted. The remainder of the program is arranged in consultation with the student's major adviser.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Arts in Education with teaching fields in French and in Spanish (School of Education).—Prerequisite: the Education curriculum, page 34.

Required: the French option or the Spanish option and the professional courses listed in the School of Education Catalogue.

* The Staff of Instruction here listed is for the academic year 1961–62.

FRENCH

First Group

1-2 *First-year French* (3-3) — The Staff

A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day and evening; spring—day and evening; summer 1962. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester.

3-4 *Second-year French (3–3)** — The Staff

A year course; credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, $6 a semester. Prerequisite: French 1–2 or two years of high school French.

9-10 *French Conversation and Composition* (3–3) — The Staff

Academic year—day and evening; summer 1962. Prerequisite: French 4 or the equivalent and permission of the instructor.

49 *French Readings for Nonmajor Students* (3) — Frey and Staff

Fall—evening; spring—evening; summer 1962. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51–52 *Survey of French Literature and Civilization (3–3)** — Metivier

Academic year—day and evening. The social, artistic, and cultural background of French civilization. Lectures, readings, recitations, and informal discussions.

Second Group*

109–10 *Advanced French Conversation and Composition* (3–3) — Meade

Academic year—day. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: French 10 or the equivalent and permission of the instructor.

119–20 *French Literature of the Sixteenth Century* (3–3) — Metivier

1963–64 and alternate years. Prose, poetry, drama, and memoirs of the French Renaissance; Rabelais, Montaigne, Marot, La Pléiade, etc. Class analysis of texts, collateral reading.

121–22 *French Literature of the Seventeenth Century* (3–3) — Clubb

1962–63 and alternate years: academic year—day. History, philosophy, criticism, memoirs, letters, eloquence, drama, fiction, poetry. Class analysis of texts; collateral reading.

123–24 *French Literature of the Eighteenth Century* (3–3) — Meade

1963–64 and alternate years. History, philosophy, criticism, letters, drama, fiction, poetry, the "salons", the idea of progress, the idea of science. Class analysis of texts, collateral reading, lectures on literature and history.

125–26 *French Literature of the Nineteenth Century* (3–3) — Frey

1962–63 and alternate years: academic year—evening. Romanticism and realism: fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

* French 3-4 is required, and French 51-52 is recommended, as prerequisite to all second-group courses.

127–28 *French Literature of the Twentieth Century* (3–3) Clubb
1963–64 and alternate years. Fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

129–30 *Contemporary French Literature* (3–3) Clubb, Meade
Summer 1962—French 129 (3). Existentialism and surrealism in the novel, poetry, and drama from 1938 to the present. Lectures, discussions, and reports.

199–200 *Proseminar: Readings for the Major in French Literature* (3–3) Frey
Academic year—as arranged. Conferences and group discussions.

THIRD GROUP

201 *Doctoral Seminar* (3) Clubb
Fall—day. Introduction to the doctoral program. Methods of research and presentation in the Romance languages and literatures.

202 *History and Methods of Literary Analysis and Criticism* (3) Meade
Spring—day. Literary criticism from Aristotle to the New Critics. Methods to be demonstrated and applied to selected passages from French literature. Emphasis on technique known as *explication de texte*.

203 *Problems of Pronunciation and Intonation* (3) Vignéras
Fall—day.

212 *Historical French Grammar* (3) Vignéras
Spring—day. Study of phonology, morphology, and syntax of Old French, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in French literature, Romance 279 *Introduction to Romance Philology and Linguistics* (see General Romance Courses), and an elementary knowledge of Latin.

213–14 *Old French* (3–3) Vignéras
Academic year—day. Survey of French literature to the end of the Middle Ages. Prerequisite: a second-group course in French literature and the permission of the instructor.

224 *Seminar: The Age of Rabelais* (3)
1963–64 and alternate years—fall. Humanism and the Reformation in French letters. Rabelais and the *conteurs*. Research projects, papers, reports.

225 *Seminar: The Age of Montaigne* (3)
1964–65 and alternate years—spring. Montaigne: the man and the development of his thought. The literature of the Religious Wars. Research projects, papers, reports. Frey

226 *Seminar: French Poetry from Villon to Malherbe* (3)
1962–63 and alternate years: fall—day. Theories and the practice of the art of poetry in the French Renaissance. The cultivation of a poetic language and the development of genres. Papers, reports. Clubb

227 *Seminar: The Renaissance in Europe* (3)
1964–65 and alternate years—fall. The sources and nature of literary trends in Western Europe from Dante to Calderón, and their relationship to French literature. Readings, papers, and discussion. Clubb

231–32 *Theater in the Seventeenth Century* (3–3)
1962–63 and alternate years: academic year—day. A survey of the development of theatrical arts and the drama. Research papers and reports. Prerequisite: French 121–22 or the equivalent. Clubb

233 *Seminar: Seventeenth Century Literary Doctrines* (3)
Offered 1964–65. The origin and formation of literary doctrines and theories and their relationship to prose, poetry, and drama of the 17th century. Readings, discussions, and papers.

234 *Nondramatic Literature of the Seventeenth Century* (3)
Offered 1963–64. Rationalism and the revolt against authority expressed in literature. Discussion of texts and collateral readings.

240 *The Sentimental Current in the Eighteenth Century* (3) Meade
Offered 1964–65. Sentimentality in the novel and drama of 18th century France. English influences on French authors. The meaning of sentimentality and its later influences.

241 *The Rationalistic Current in the Eighteenth Century* (3) Meade
Offered 1964–65. Bayle, Fontenelle, Montesquieu, Voltaire, Rousseau, Diderot, and the Encyclopedists as philosophers, dramatists, and critics of their age; an assessment of their contributions to the intellectual evolution of France and Europe.

242 *Seminar: the French Novel in the Eighteenth Century* (3) Meade
Fall—day. Development of the novel in France from *La Princesse de Clèves* to the French Revolution; themes and techniques.

243 *Voltaire and Rousseau* (3) Meade
Spring—day. Voltaire and Rousseau as representatives and critics of their age.

244 *Seminar: Diderot and the Encyclopedia* (3) Meade
Offered 1963–64. Diderot's contribution to 18th century novel, drama, and aesthetic criticism; the Encyclopedia as embodiment of 18th century thinking.

250 *Romanticism in France* (3) Frey
Fall—day. The theory and practice of romanticism in France: romantic love, the Napoleonic myth, exoticism, local color, sensationalism, and religiosity as reflected in new styles of prose and poetry Romantic criticism. The preparation for realism.

251 *Realism and Naturalism* (3) Frey
Spring—day. Prose style in the French novel from Balzac to Zola; the influence of history, science, philosophy, and art on the literary doctrines of realism and naturalism; realistic currents with romanticism; the minor realists and naturalists; realism in poetry and in the theatre.

252 *Seminar: Flaubert* (3) Frey
Offered 1964–65. Reading and analysis of the works of Flaubert from *Mémoires d'un fou* to *Bouvard et Pécuchet*, plus selected correspondence. Romantic elements in the works of Flaubert; Flaubert and the impersonality of the writer, the doctrine of art for art, Bovarysme, style indirect libre. Contemporary criticism of Flaubert.

253 *Seminar: Symbolism in Poetry* (3) Clubb
Offered 1964–65. The origin and nature of symbolism from Baudelaire to Valéry. Class analysis of texts and reports. Prerequisite: French 127–28 or the equivalent.

254 *Seminar: Victor Hugo* (3) Frey
Offered 1964–65. Hugo and the development of the romantic ideal in prose and poetry; Hugo and romantic theater and criticism. Analysis, classification, and criticism of romantic themes and techniques in the works of Hugo; contemporary Hugo criticism.

255 *Seminar: Stendhal and Le Beylisme* (3) Clubb
Spring—day. Stendhal's novels and autobiographical works. Stendhal and his public. Readings, discussions, and papers.

SPANISH

First Group

1–2 *First-year Spanish* (3–3) The Staff
A year course; credit is not given for the first half until the second half is completed. *First half*: fall—day and evening; spring—day and evening; summer 1962. *Second half*: fall—day and evening; spring—day and evening; summer 1962. For beginners.

Pronunciation, conversation, grammar, composition, reading of modern Spanish pros... Aural training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester.

3–4 *Second-year Spanish** (3–3) The Staff
A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—day and evening; summer 1962. *Second half:* fall—day; spring—day and evening; summer 1962. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language laboratory. Laboratory fee, $6 a semester. Prerequisite: Spanish 1–2 or two years of high school Spanish.

9–10 *Spanish Conversation and Composition* (3–3) The Staff
Academic year—day and evening. Prerequisite: Spanish 4 or the equivalent and permission of the instructor.

49 *Spanish Readings for Nonmajor Students* (3) The Staff
Fall—evening; spring—evening. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51–52 *Survey of Spanish Literature and Civilization** (3–3) Supervis
1962–63 and alternate years: academic year—day. 1963–64 and alternate years: academic year—evening. The social, artistic, and cultural background of Spanish civilization. Lectures, readings, recitations, and informal discussion.

SECOND GROUP*

109–10 *Advanced Spanish Conversation and Composition* (3–3) Mazzeo
Academic year—day. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: Spanish 10 or the equivalent and permission of the instructor.

121–22 *Spanish Literature of the Golden Age* (3–3) Supervis
1963–64 and alternate years: academic year—day. Lope de Vega, Calderon; the classic drama, the ballad, lyric poetry, prose. Class analysis of texts, collateral reading, lectures on literature and history.

123–24 *Cervantes: Don Quijote* (3–3) McSpadden
1962–63 and alternate years: academic year—day. Life and works of Cervantes; the *Quijote* and its relationship to other works of the Golden Age. Lectures, discussions, and reports.

125–26 *Modern Spanish Literature* (3–3) Mazzeo
1962–63 and alternate years: academic year—evening. 1963–64 and alternate years: academic year—day. Prose and poetry of the 18th and 19th centuries. Class analysis of texts, collateral reading, lectures on literature and history.

127–28 *Contemporary Spanish Literature* (3–3) Supervis
1963–64 and alternate years: academic year—day. Prose and poetry of the 20th century. Class analysis of texts, collateral reading, lectures on literature and history.

129 *The Romantic Drama in Spain* (3) Mazzeo
Summer 1962 and alternate summers—evening. Class analysis of texts, collateral reading and lectures on the Spanish Romantic Drama.

151–52 *The Spanish-American Novel* (3–3)
1962–63 and every third year: academic year—as arranged. Development of the novel in Spanish America. Lectures, collateral reading, and class analysis of texts.

* Spanish 3–4 is required, and Spanish 51–52 is recommended, as prerequisite to all second-group courses in Spanish.

155–56 *Spanish-American Literature to 1880* (3–3) Robb
1963–64 and every third year. The literature of Spanish America from the colonial period to the latter part of the 19th century. Lectures, collateral reading, reports, and class analysis of important works.

157–58 *Spanish-American Literature since 1880* (3–3) Robb
1964–65 and every third year. The literature of Spanish America from 1880 to the contemporary period. Lectures, collateral reading, reports, and class analysis of important works.

197–98 *Proseminar: Readings for the Major in Spanish-American Literature* (3–3) Robb
Academic year—as arranged. Conferences and group discussions.

199–200 *Proseminar: Readings for the Major in Spanish Literature* (3–3) Lozano
Academic year—as arranged. Required of all majors. Conferences and group discussions.

THIRD GROUP

301 *Doctoral Seminar* (3) The Staff
Fall—day. Introduction to the doctoral program, advanced study and methodology in the Romance languages and literatures.

202 *Explicación de textos* (3) Robb
1962–63 and alternate years: spring—day. An analytical introduction to the study of Spanish and Spanish-American literature. The method will be demonstrated and practiced on selected passages.

212 *Historical Spanish Grammar* (3) McSpadden
Spring—day. Study of phonology, morphology, syntax, and lexicology of Old Spanish, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in Spanish literature, Romance 279 *Introduction to Romance Philology and Linguistics* (see General Romance Courses), and an elementary knowledge of Latin.

214 *Old Spanish* (3) McSpadden
Offered 1964–65. Literature and language: *El poema de Mío Cid, El Conde Lucanor, El Libro de Buen Amor*, etc. Prerequisite: a second-group course in Spanish literature, Romance 279 *Introduction to Romance Philology and Linguistics* (see General Romance Courses), and an elementary knowledge of Latin.

221 *Seminar: Works of Cervantes* (3) McSpadden
Offered 1964–65. Problems of composition, interpretation, criticism, literary history, and aesthetics.

222 *Seminar: Spanish Mystics* (3) Lozano
Offered 1964–65. A study of Spanish mysticism with particular attention to the poetry of Ramon Lull, Fray Luis de León, Santa Teresa, San Juan de la Cruz, and other mystics.

223 *Seminar: Drama of the Golden Age* (3) Lozano
Offered 1964–65. A study of the Spanish theater from its beginnings to Calderón. Reading and analysis of representative works of Lope, Tirso, Alarcón, Calderón, and the pre-Lopistas.

224 *Seminar: the Renaissance in Spain* (3) Supervía
Offered 1963–64. A study of the thought and literary currents that led to the Spanish Renaissance and its development.

225 *Seminar: Lyric Poetry of the Golden Age* (3) Supervía
Offered 1963–64. A study of the principal lyric poets from Garcilaso.

226 *Seminar: Picaresque Novel* (3) Lozano
Spring—day. The Picaresque genre in Spain: origin and development and most re cent manifestations. Reading and commentary on texts.

231 *Seminar: Spanish Writers of the Eighteenth Century* (3) Mazzeo
Fall—day. Lectures and analysis of principal authors and works; relationships wit subsequent literary movements.

232 *Seminar: Spanish Critics and Thinkers of the Eighteenth Century* (3) Mazzeo
Offered 1964–65.

241 *Seminar: Works of Goldós* (3) Supervia
Offered 1964–65. Ideological and stylistic analysis; relationship of his works to the literary movements of the second half of the 19th century.

242 *Seminar: Spanish Romanticism* (3) Mazzeo
Offered 1964–65. Lectures and analysis of principal works and authors. Collateral readings. Problems of origins and developments.

244 *Seminar: the Spanish Novel of the Nineteenth Century* (3) Mazzeo
Offered 1963–64. A study of the leading Spanish novelists of the 19th century. Read ing and analysis of important works.

251 *Seminar: Works of Unamuno and Ortega y Gasset* (3) Supervia
Fall—day. A study of the thought of Unamuno and Ortega y Gasset; reading of texts and commentaries.

252 *Seminar: Spanish Literature since the Civil War* (3) Supervia
Spring—day. A study of all literary currents in Spain since the Civil War: drama, prose, poetry.

253 *Seminar: Modernismo* (3) Robb, Lozano
Offered 1963–64. A study of the genesis and development of Modernismo in His panic America and Spain with special attention to Spain.

261 *Seminar: Spanish-American Essayists* (3) Robb
Offered 1963–64. The Spanish-American essay as an artistic form, studied in selected modern essayists such as Rodó, Ricardo Rojas, Vasconcelos, Arciniegas.

262 *Seminar: Contemporary Spanish-American Poetry* (3) Lozano
Offered 1963–64. Studies of aesthetic principles and poetic movements. Emphasis on Huidobro, Neruda, and others.

263 *Seminar: Contemporary Spanish-American Novelists* (3) Robb
Offered 1964–65. Selected contemporary novelists such as Gallegos, Barrios, M. Ro jas, J. R. Romero, Carlos Fuentes, Alejo Carpentier.

264 *Seminar: Contemporary Spanish-American Short Story* (3) Robb
Offered 1964–65. Twentieth century *Cuentistas* from Quiroga to J. L. Borges, J. J. Arreola, and others.

266 *Seminar: Alfonso Reyes* (3) Robb
Spring—day. Alfonso Reyes the essayist artist, poet, and complete humanist as studied in his various prose and poetic works.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged.

GENERAL COURSES IN ROMANCE LANGUAGES AND LITERATURES

270 *Experimental Phonetics* (3) McSpadden
Offered 1963–64. History; problems and methods of analysis in the physiological and acoustical branches of phonetics and intonation, their relationships, their applica tion to the Romance languages, and oral aspects of the Romance literatures.

272 *Comparative Romance Languages and Literatures I (Italian)* (3) Lozano
1962–63 and alternate years: fall—day. Intensive study of Italian grammar with reference to French, Spanish, and other Romance languages.

273 *Comparative Romance Languages and Literatures II (Italian)* (3) Clubb
Spring—day. For candidates for the degree of Doctor of Philosophy. The Italian language and literature from Dante to Goldoni. Lectures, discussions, exercises, and readings. Prerequisite: Romance 272 *Comparative Romance Languages and Literatures I* or the equivalent.

275–76 *Comparative Romance Languages and Literatures III–IV (Portuguese)* (3–3) Robb
Academic year—day. For candidates for the degree of Doctor of Philosophy. Lectures, discussions, exercises, and readings.

277–78 *Comparative Romance Languages and Literatures V–VI (Portuguese)* (3–3) Robb
Offered 1963–64. For candidates for the degree of Doctor of Philosophy. Portuguese and Brazilian literatures from Camões to the 20th century.

279 *Introduction to Romance Philology and Linguistics* (3) McSpadden
1962–63 and every third year: fall—day. Study of principles found in the development of the Romance languages and methods of analysis at the present time. A general course for graduate students in the fields of the Romance languages and literatures. Prerequisite: an elementary knowledge of Latin. This course is normally followed by French 212 or Spanish 212.

280 *Introduction to Romance Stylistics* (3) Frey
Offered 1964–65. Special emphasis will be placed on examples from French and Spanish literature.

283 *Problems of Teaching Romance Languages and Literatures in College* (3) McSpadden
Fall—day. For candidates for the degree of Doctor of Philosophy. Principles and problems of learning and teaching the language and literature. Apprenticeship in college classes and the language laboratory.

SLAVIC LANGUAGES AND LITERATURES *

Associate Professor Helen Yakobson *(Chairman)*
Lecturers Kiril Jaszenko, George Olkhovsky, Vadim Medish, Natalie Kalikin, Irene Bodrov, M. I. Filipovitch-Nikatch

Bachelor of Arts with a major in Russian (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32.
Required: in addition to the general requirements, pages 37–42, eighteen semester hours to be selected from second-group courses in Russian; Slavic Languages 91–92, 179–80; and History 143, 145–46.
Russian majors are expected to have a reasonable proficiency in spoken and written Russian, a firm grasp of the fundamentals of Russian grammar, a general comprehension of Russian history, and a general knowledge of Russian literature, as well as some first-hand acquaintance with writings of major Russian writers. Students who are already proficient in Russian, may upon passing an appropriate examination, waive any or all of the first-group language courses, as well as up to six hours of second-group language courses.

Bachelor of Arts in Education with a minor teaching field in Russian (School of Education).—Prerequisite: the Education curriculum, page 34.
Required: the professional courses listed in the School of Education Catalogue.

* The Staff of Instruction here listed is for the academic year 1961–62.

First Group

1–2 *First-year Russian* (3–3) Yakobson and Staff

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening; summer 1962. *Second half:* fall—evening; spring—day and evening; summer 1962. A beginners' course to fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in electronic language workshop. Workshop fee, $6 a semester.

3–4 *Second-year Russian* (3–3) Yakobson and Staff

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—day and evening; spring—evening. *Second half:* fall—evening; spring—day and evening. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Workshop fee, $6 a semester.

9–10 *Russian Conversation* (3–3) Olkhovsky

Academic year—evening; summer 1962. Listening comprehension and oral practice. Prerequisite: Russian 3–4 or permission of the instructor. Workshop fee, $6 a semester.

91–92 *Introduction to Slavic Literature* (3–3) Medish, Filipovitch-Nikatch

Academic year—day and evening. Lecture, recitation, and discussion. *First half:* a survey of Russian literature in translation from early periods through the literary masterpieces of the 19th century. *Second half:* a survey of other Slavic literatures, 18th century to the present, with emphasis on the contemporary scene.

Second Group

101–2 *Readings in Modern Russian* (3–3) Medish

1963–64 and alternate years. Representative Russian readings in the social sciences and periodical literature.

103–4 *Scientific Russian* (3–3) Medish

1963–64 and alternate years. Readings in the major fields of Russian contemporary scientific literature.

109–10 *Advanced Russian Conversation and Composition* (3–3) Yakobson

Academic year—evening. Developing proficiency in oral and written expression. Prerequisite: Russian 10.

141–42 *Russian Literature of the 19th Century* (3–3) Yakobson

1962–63 and alternate years: academic year—day and evening. Lectures, special reports, class analysis of selected works of 19th century Russian literature—in Russian. Prerequisite: Russian 1–2, 3–4.

151–52 *Russian Literature of the 20th Century* (3–3) Yakobson

1963–64 and alternate years. Lectures, special reports, class analysis of selected works of 20th century Russian literature—in Russian. Prerequisite: Russian 1–2, 3–4.

179–80 *Advanced Grammar and Composition for Russian Majors* (1–1) Yakobson

Academic year—as arranged.

SOCIOLOGY AND ANTHROPOLOGY*

Professor H. L. Geisert *(Chairman)*
Associate Professor R. W. Stephens
Assistant Professors J. M. Campbell, Samuel Baum, P. F. Gallagher
Lecturers Jane Wickey, J. A. Bartolini

Bachelor of Arts with a major in Sociology and Anthropology (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including six hours in first-group courses in Sociology and Anthropology.

Required: in addition to the general requirements, pages 37–42, twenty-four semester hours in Sociology and Anthropology, which must include 172 and 181.

Master of Arts in the field of Sociology and Anthropology.—Prerequisite: the degree of Bachelor of Arts with a major in Sociology and Anthropology in this University or the equivalent.

Required: the requirements, pages 43–45, including a minimum of eighteen hours in third-group courses.

First Group

1–2 *Man in Modern Society*† (3–3) — The Staff

First half: fall—day and evening; spring—day; summer 1962. *Second half:* fall—day; spring—day and evening. Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national, and international disorganization.

51 *Introduction to Anthropology*† (3) — The Staff

Fall—day and evening; spring—day and evening; summer 1962. Physical development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships.

Second Group

115 *Cultural Anthropology* (3) — Campbell

Fall—day. Development of social life and customs in preliterate societies, universals, and aspects of culture; theories relating to culture, society, and personality.

116 *Native Peoples of the New World* (3) — Campbell

Spring—day. A survey of representative Indian groups of the Americas from primitive bands to high civilizations, stressing the patterned nature of diverse cultural responses to universal problems of human existence.

123 *Fields of Social Work* (3)

1963–64 and alternate years. Introduction to the nature and scope of social work; the development of social work program; functions of social case work, social group work, and social action.

124 *Medical Sociology* (3) — Wickey

Spring—day. Sociological factors and processes which relate to physical and mental health and disease; analysis of patterned social relationships in the field of health and medicine; the hospital as a social system.

126 *Urban Sociology* (3) — Baum

1962–63 and alternate years: spring—day. The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.

127 *Community Organization* (3)

1963–64 and alternate years. Principles common to communities throughout the world: social interaction and social disorganization, population growth and community structure, spatial organization, community change.

* The Staff of Instruction here listed is for the academic year 1961–62.
† Sociology and Anthropology 1 or 51 is prerequisite to all other courses in Sociology and Anthropology.

131 *Social Institutions* (3)
1963–64 and alternate years. Functional analysis of basic social institutions: family, education, religion, economy, and state in the structure of American society.

132 *Courtship and Marriage* (3) Stephens
1963–64 and alternate years. Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.

133 *The Family in Modern Society* (3) Baum
1963–64 and alternate years. Historical development of the family as a social institution, parent child relations, family problems, disorganization and divorce, and family reorganization.

134 *Sociology of Child Development* (3) Stephens
1963–64 and alternate years. Socialization of the child through the home and other social institutions; the changing status of childhood, dependent and handicapped children.

135 *Juvenile Delinquency* (3) Wickey
1962–63 and alternate years: fall—day. Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.

136 *Criminology* (3)
1963–64 and alternate years. Nature and distribution of crime, police and court systems, prisons and reformatories; treatment and prevention of crime.

141 *Population Problems* (3) Baum
1962–63 and alternate years: fall—day. Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies: eugenics and birth control.

142 *Race and Culture Configurations* (3) Gallagher
Spring—day. The biological background; the origin and races of mankind, and the social and cultural effects of concepts of race.

143 *Language and Culture* (3) Gallagher
Summer 1962. The nature and significance of human communication, the distribution and dynamics of languages, linguistic changes, the role of language in culture.

144 *Mass Communications* (3) Baum
1963–64 and alternate years. The communications process; barriers to communication; structure and function of communication in society; content, control, support, and effects of mass communication.

151 *Human Relations in Industry* (3) Stephens
1963–64 and alternate years. Sociological analysis of work situations, occupational mobility, development of the labor movement, industrial leadership and morale.

152 *Dynamics of Culture* (3) Campbell
1962–63 and alternate years: spring—evening. Factors and processes making for stability and change in cultures; "the nature and characteristics of cultural growth invention, diffusion, and acculturation"; the integration and disintegration of cultures.

153 *Culture and Personality* (3) Gallagher
Fall—evening. Influences of group membership and cultural conditions on personality; socio-cultural factors in mental health; the relationship of personality to class, caste, and occupation.

155 *Applied Anthropology* (3) Gallagher
1962–63 and alternate years: fall—day. The application of anthropological methods and techniques in the modern world. The use of applied anthropology in specific fields, including government, business, law, and medicine.

161 *Social Stratification: Class and Status* (3) Stephens
1962–63 and alternate years: fall—day. Nature of class structure patterns of status, prestige relations in American society, differential class behavior, analysis of comparative social structure and social mobility.

162 *Social Movements* (3) Stephens
1962–63 and alternate years: spring—day; summer 1962. Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and show the way social movements develop.

164 *Social Control* (3)
1963–64 and alternate years. Informal and formal phases of human control, analysis of methods of control used in modern society and the situations in which they occur, policies and techniques of control.

172 *Contemporary Social Theory* (3) Stephens
Spring—evening. Systematic study of the important schools of contemporary sociology, including recent European as well as American developments; an evaluation of the scientific contributions of each school.

181 *Methods of Social Research* (3) Stephens
Fall—evening. Analysis of social research techniques and the scientific method; application to social data of the case study, social survey, statistical, sociometric, and experimental methods.

Third Group

221 *Seminar: Current Trends in Sociology* (3) Geisert
1962–63 and alternate years: fall—evening. Analysis and evaluation of recent developments in sociology and an appraisal of the role of systematic theory in sociology.

222 *Seminar: Anthropological Theory* (3) Gallagher
1962–63 and alternate years: spring—evening. Analysis of the theoretical postulates and assumptions underlying the development of modern cultural and social anthropology.

223 *Cultural Origins of the Western Hemisphere* (3)
1963–64 and alternate years. An examination of the problems of the nature and time of Early Man's entry to the Americas; the development of Paleo Indian societies, stressing their varied cultural adjustments to diverse environments.

224 *Anthropological Methods* (3)
1963–64 and alternate years. Traditional approaches to library and field research in linguistics, archeology, and ethnography; conceptual bases and bias in the delineation of problems, in the selection, analysis and organization of data, and in the preparation of the final report.

225 *Seminar: Small Groups* (3)
1963–64 and alternate years. General characteristics of small groups and their measurement; sociography of groups, evaluation of small group theory and sociometry; other techniques of small group research.

226 *Problems of Underdeveloped Areas* (3)
1963–64 and alternate years. Characteristics and problems of underdeveloped areas; the interrelationship of demographic, economic, social, and cultural factors; measures and techniques to introduce cultural changes.

227 *Religious Beliefs of Preliterate Peoples* (3) Campbell
1962–63 and alternate years: fall—evening. Conceptions of the supernatural in nonliterate societies. An examination of religious beliefs and practices; the interrelatedness of religion, magic, and philosophy.

228 *Criminal Behavior: Research and Theory* (3) Geisert
1962–63 and alternate years: spring—evening. A re-evaluation of theories of criminal and deviant behavior based on recent research findings; implications for the correction and prevention of criminal behavior.

295–96 *Research* (arr.) — The Staff
Academic year—as arranged; summer 1962.

299–300 *Thesis* (3–3) — The Staff
Academic year—as arranged: summer 1962.

SPEECH*

Professors L. P. Leggette *(Chairman)*, C. W. Pettit *(Director of Speech Clinic)*, G. F. Henigan, Jr., E. L. Stevens
Professorial Lecturer Zelda Fichandler
Associate Professor Lee Bielski
Associate Professorial Lecturers F. C. Strickland, Zelda Kosh
Lecturers Edith Surrey, A. A. Nilles, S. L. Berlinsky, Isabel Burger, R. E. Shutte, H. C. Krebs, L. W. Shollenberger
Associates Joan Regnell, Lois Richards, Marjorie Prussing

Bachelor of Arts with a major in Speech (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including Speech 1, 2, 11, 32.

Required: the general requirements, see pages 37–42, including the passing of a speech proficiency test early in the program; Speech 101, 121, 154, 171; and a minimum of twelve additional hours in second-group courses in the speech arts or speech science, as approved by the adviser.

Bachelor of Arts with a major in Dramatic Art (Departmental).—Prerequisite: the Arts and Letters curriculum, page 32, including twelve hours in the basic courses in speech and six hours in English 51–52, 71–72, or 91–92.

Required: the general requirements, pages 37–42, including the passing of a speech proficiency test early in the program. Speech 101–2, a minimum of nine additional hours in theater arts in the Speech Department and nine hours in dramatic literature in the English Department, as approved by the adviser.

Master of Arts in the field of Speech Correction.—Prerequisite: the degree of Bachelor of Arts with a major in Speech from this University, or the equivalent.

Required: the general requirements, pages 43–45.

Master of Fine Arts in the field of Dramatic Art.—Prerequisite: the degree of Bachelor of Arts from this University, or the equivalent.

Required: the general requirements, see pages 43–45, twelve hours of second- and third-group courses in drama and dramatic literature offered on campus, and twelve hours in theatre offered at the Arena Stage.

Four semesters in residence are required to complete this program. For detailed information, consult the Chairman of the Department.

Bachelor of Arts in Education with a teaching field in Speech (School of Education).—page 34.

Required: the Speech option and the professional courses listed in the School of Education Catalogue.

First Group

A *Speech Clinic* — Pettit, Bielski
Academic year—as arranged; summer 1962. Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, $7; for group lesson, $4.

B *American Speech for Foreign Students* (3) — Bielski
Fall—day and evening; spring—day and evening; summer 1962. Class limited to foreign-born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Recording fee, $5.

* The Staff of Instruction here listed is for the academic year 1961–62.

1 *Effective Speaking* (3) — Leggette and Staff
Fall—day and evening; spring—day and evening; summer 1962. Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, $2.

2 *Persuasive Speaking* (3) — Henigan and Staff
Fall—day; spring—day and evening. A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

11 *Voice and Diction* (3) — The Staff
Fall—day and evening; spring—day and evening; summer 1962. Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, $4.

32 *Oral Reading* (3) — Leggette and Staff
Fall—day; spring—day and evening; summer 1962. Reading to others, theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11. Recording fee, $2.

SECOND GROUP

101 *Voice and Phonetics* (3) — Bielski
Fall—day. The International Phonetic Alphabet and its applications to the student's own speech improvement; also its application to such fields as theater, public speaking, speech correction, radio, television, and foreign languages. Prerequisite: Speech 11. Recording fee, $4.

102 *Oral Interpretation of Literature* (3) — Leggette
Spring—day. Theory and practice in the problems of communicating meaning and emotion. Selections for study include poetry and prose. Prerequisite: Speech 32. Recording fee, $2.

111 *Effective Speech Communication* (3) — Bielski
Not offered 1962–63. The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to speech majors.

121 *Group Discussion and Conference Leadership* (3) — Stevens
Fall—day; spring—evening; summer 1962. The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor.

126 *Public Discussion and Debate* (3) — Henigan
Spring—day. Principles and types of public discussion and debate; practice in argumentative speaking on questions of current interest. Prerequisite: 6 hours of speech or the permission of the instructor.

127–28 *Advanced Debate Practice* (1–1) — Henigan
Academic year—as arranged. Admission by permission of the instructor, after one semester of satisfactory participation in the intercollegiate debate program. This course may be repeated for a total of 4 semester hours.

133–34 *Radio and TV Broadcasting* (3–3) — Shollenberger
Academic year—evening. A study of the development of the radio and TV industries, station organization and management, equipment, production techniques; practice in the preparation and performance of radio programs. Recording fee, $5 a semester.

141 *Public Speaking: Advanced Forms* (3) — Henigan
Spring—day. The preparation and presentation of speeches for formal occasions with emphasis on the psychology of the audience. Prerequisite: 6 semester hours of speech.

145 *Speech Criticism* (3) Henigan
Not offered 1962–63. A study of rhetorical theory with application to the criticism of representative American and British oratory. Admission by permission of the instructor.

153 *Acting* (3) Strickland
Fall—evening. Study and practice in the fundamentals of acting technique. Prerequisite: Speech 32. Laboratory fee, $5.

154 *Play Production* (3) Strickland
Spring—evening. Fundamentals of play production. Under the supervision of the instructor, students prepare one-act plays for presentation. Laboratory fee, $5.

155–56 *Play Production Practice* (1–1) The Staff
Academic year—as arranged. Practical work in theater.

166 *History of the Theater* (3) Nilles
Spring—evening. A general survey of the rise of the theater, the Classical, Medieval, Renaissance, later English and Continental, and the Modern theater.

169 *Creative Dramatics* (3) Prussing
Fall—evening. A study of creative dramatics and its use as a learning tool.

170 *Children's Theater* (3) Burger
Spring—evening. Theory and practice in creating and producing plays for children.

171 *Introduction to Speech Correction* (3) Pettit
Fall—evening. A survey of the disorders of speech, including symptomatology, testing, causation, and therapy.

173–74 *Speech Therapy* (3–3) Bielski
Academic year—day. Clinical techniques and procedures involved in the correction of the disorders of speech. Prerequisite: Speech 101 and 171.

176 *Speech Correction* (3) Pettit
Spring—evening. Advanced study of the disorders of speech. Prerequisite: Speech 171 and 173.

177–78 *Clinical Practice in Speech Therapy* (1–1) The Staff
Academic year—as arranged; summer 1962—Speech 177 (1). Supervised case work in remedial speech—the University Speech Clinic, Children's Hospital, District of Columbia Crippled Children's Society, and Public School system. Weekly meetings to discuss therapeutic techniques for the common speech problems. This course may be repeated for a total of 4 semester hours. Prerequisite: Speech 101, 171, 173, and permission of the instructor.

182 *Hearing Problems and the Testing of Hearing* (3) Shutts
Fall—evening. A study of the field of audiology with emphasis on the testing of hearing.

183–84 *Clinical Practice in Hearing Therapy* (1–1) The Staff
Academic year—as arranged; summer 1962—Speech 183 (1). Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and Children's Hospital. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of the instructor.

THIRD GROUP

251 *Rehearsal and Performance* (3) Arena Stage Staff
Fall—as arranged; spring—as arranged. A course putting into practice the principles and techniques of acting through participation in play rehearsals and performances at the Arena Stage. Admission by audition or interview.

254 *Directing Problems* (3) — Arena Stage Staff
Fall—as arranged; spring—as arranged. Observation and participation in solving the problems involved in directing plays. Admission by interview.

255 *Techniques of Staging* (3) — Arena Stage Staff
Fall—as arranged; spring—as arranged. Application of theory and principles of scene design, costuming, lighting, make-up, and related stage techniques. Admission by interview.

263 *Theater Management* (3) — Arena Stage Staff
Fall—as arranged; spring—as arranged. Theory and practice in the psychology of handling the public: promotion, box office and house management. Admission by interview.

264 *Producing Problems* (3) — Arena Stage Staff
Fall—as arranged; spring—as arranged. Problems involved in producing community and professional theater. Admission by interview.

279 *Speech Science* (3) — Berlinsky
Fall—evening. The anatomy, physiology, physics, and psychology of speech production, with a survey of experimental work.

280 *Speech Pathology* (3) — Pettit
Summer 1962. An advanced study of the causes and symptoms of the major physiogenic and psychogenic disorders. Prerequisite: Speech 171 and 176.

284 *Speech Reading and Auditory Training* (3) — Shutts
Spring—evening. Theory and practice in speech reading and auditory training with an analysis of methods used for the instruction of hearing handicapped children and adults. Prerequisite: Speech 182.

286 *Seminar in Speech Pathology* (3) — Pettit
Spring—evening.

294 *Research in Dramatic Art* (ARR.) — The Staff
Spring—as arranged.

295–96 *Research in Speech and Hearing* (ARR.) — The Staff
Summer 1962—Speech 295 (ARR).

299–300 *Thesis* (3–3) — The Staff
Academic year—as arranged; summer 1962.

Courses Offered in Special Programs

In addition to the regular courses the University offers the following course, which is available to personnel in the U. S. Navy and Marine Corps.

111 *Effective Speech Communication* (3)

Related Courses in Other Departments

English 125, *Introduction to English Linguistics* (3)
English 135–36, *Shakespeare* (3–3)
English 175–76, *American Drama* (3–3)
English 183–84, *The English Drama* (3–3)
English 235–36, *Studies in Shakespeare and His Contemporaries* (3–3)
Education 134, *Student Teaching in Secondary Schools* (6–9)
Education 152, *Teaching Speech* (2 to 4)

STATISTICS*

Professors F. M. Weida *(Emeritus)*, E. H. Johnson, H. F. Bright *(Chairman)*
Professorial Lecturers Solomon Kullback, Samuel Greenhouse
Associate Professorial Lecturers Seymour Geisser, Morton Kupperman, Arnold Heyl
Assistant Professor R. E. Thomas
Lecturers S. J. Armore, Fred Frishman, H. F. Sieber, Jr., W. M. Wolman

Bachelor of Arts or *Bachelor of Science with a major in Mathematical Statistics (Field of Study).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32, including Mathematics 23 or 30; Statistics 91.

Required: the general requirements, pages 37–42, including Mathematics 24; Statistics 117, 118, 155, 157–58, and six additional hours of second-group Statistics courses selected with the approval of the adviser; a minimum of twenty four semester hours of courses in other departments approved by the adviser as contributing to a well organized program; and the grade of "pass" on the major examination at the end of the senior year. For further details, consult the adviser.

Master of Arts or *Master of Science in the field of Mathematical Statistics.*—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Mathematical Statistics at this University, or the equivalent.

Required: the general requirements, pages 43–45, including a thesis in Statistics and at least twelve hours to be selected from approved third-group courses in Statistics. The remaining twelve hours must be selected in consultation with the adviser.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

Bachelor of Business Administration or *Master of Business Administration with a major in Business and Economic Statistics (School of Government, Business, and International Affairs).*—See the general catalogue.

First Group†

51 *Introduction to Business and Economic Statistics* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening; summer 1962. Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data: consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

52 *Mathematics of Finance* (3) The Staff
Lecture (3 hours). Fall—day and evening; spring—day and evening. Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra.

53 *Introduction to Statistics in Psychology and Education* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall—day and evening; spring—day and evening. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

91 *Principles of Statistical Methods*‡ (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening; spring—day. Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

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* The Staff of Instruction here listed is for the academic year 1961–62.

† Of first-group courses, Statistics 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Statistics 52 lies outside of this group, and may be taken for degree credit in combination with any one of the other three.

‡ Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

SECOND GROUP

104 *Statistics in Psychology and Education I* (3) Bright
Lecture (2 hours), laboratory (2 hours). Fall—Saturday morning; summer 1962. Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, $9.

105 *Statistics in Psychology and Education II* (3) Bright
Lecture (2 hours), laboratory (2 hours). Spring—Saturday morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53 or 104. Laboratory fee, $9.

106 *Factor Analysis* (3)
Summer 1962. Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, $9.

107 *Statistics for Engineers* (3) The Staff
Fall—evening; spring—evening; summer 1962. Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

109 *Managerial Statistics* (3)
Not offered 1962–63. Role of statistics and the contribution of statistical procedures in various phases of business management with emphasis on the need for and usefulness of the statistical method rather than the mechanics of analysis. Subject matter comprises sources and methods for collecting data, effective forms of presentation, techniques for summarizing and analyzing quantitative and qualitative information, interpretation of and inferences from available data. Admission by permission of the instructor or following Statistics 51.

110 *Quality Control Techniques* (3)
Not offered 1962–63. Applications of probability and distribution theory to industrial control problems; use of quality control charts; acceptance sampling plans; estimation of lot and process characteristics. Prerequisite: Statistics 51 or permission of instructor.

111 *Business and Economic Statistics I* (3) Johnson
Fall—day and evening. Statistical processes as related to the problems of business and economic research with emphasis on decision making under conditions of uncertainty. Topics include averages, dispersion, analysis of variance, correlation, quality control, and index numbers. Prerequisite: Statistics 51 or permission of instructor.

112 *Business and Economic Statistics II* (3) Johnson
Spring—day and evening. Specific problems of business and economics with statistics as a tool of analysis. Introduction to principles and use of linear programming, game theory and queueing theory techniques. Study of various economic relationships, including demand, supply, cost and price functions. Prerequisite: Statistics 111 or equivalent.

117 *Analysis of Variance I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening. The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Prerequisite: Statistics 91. Laboratory fee, $9.

118 *Correlation and the Chi-square Test I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Spring—evening; summer 1962. Regression and correlation theory: simple, partial, and multiple; nonparametric methods; analysis of covariance; contingency table analysis; tests of goodness of fit. Prerequisite: Statistics 91. Laboratory fee, $9.

121 *Index Numbers* (3)
Not offered 1962–63. Definition and theory of index numbers, methods of construction, their interpretation, use, and limitations. Prerequisite: Statistics 51 or the equivalent.

122 *Forecasting Principles and Techniques* (3) Johnson
Spring—day. Survey and appraisal of techniques for measuring the state of business conditions and an examination of current indicators. Study of procedures for estimating future values: budget requirements, price levels, or level of general business activity. Prerequisite: Statistics 51 or the equivalent.

123 *Introduction to Econometrics* (3) Johnson
Fall—day. A basic quantitative approach to fundamental problems in economic theory involving the use of statistical processes, simple model construction, and probability considerations. Prerequisite: elementary course in Economics and Statistics.

155 *Introduction to Mathematical Probability* (3) The Staff
Fall—day; spring—evening; summer 1962. Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers. Prerequisite: permission of instructor.

157–58 *Mathematical Statistics* (3–3) Kupperman
Academic year—day and evening. Distribution theory, sampling theory, estimation, hypothesis testing, confidence methods, regression analysis, experimental design. Prerequisite: differential and integral calculus.

189–90 *Mathematical Probability and Applications* (3–3) Geiser
Academic year—evening. Combinatorial analysis, conditional probability and stochastic independence, probability distributions, laws of large numbers, recurrent events, random walks, Markov chains, simple time-dependent stochastic processes. Prerequisite: Statistics 155 or permission of instructor.

191 *Statistical Mathematics I** (3) Bright
Fall—evening. Problems in statistics with the development of processes from modern algebra necessary for their solution. Prerequisite: differential and integral calculus or permission of instructor.

192 *Statistical Mathematics II* (3)
Lecture (2 hours), laboratory (2 hours). Not offered 1962–63. Linear computations as applied to least squares, multiple correlation, regression, and analysis of variance problems. Prerequisite: Statistics 191 or the equivalent. Laboratory fee, $9.

193 *Statistical Mathematics III** (3) The Staff
Spring—evening. Problems in statistics with the development of real variable theory necessary for their solution. Prerequisite: differential and integral calculus.

194 *Statistical Mathematics IV** (3) The Staff
Fall—evening. Problems in statistics with the development of complex variable theory necessary for their solution. Prerequisite: differential and integral calculus.

195–96 *Reading and Research in Statistics* (arr.) The Staff
Academic year—as arranged.

199–200 *Proseminar: Theoretical and Applied Statistics* (3–3) The Staff
Not offered 1962–63. In addition to the study of recent advances in statistical methods, this course is designed to coordinate the content of the baccalaureate major. Admission by permission of the instructor.

THIRD GROUP*

201 *Design of Experiments* (3)
Not offered 1962–63. Relative merits of random, repeated, stratified, and double sampling; Fisher-Pitman method of randomization; randomized blocks; Latin squares; factorial design; confounding, partial confounding.

* Statistics 191, 193, and 194 or the equivalent are prerequisite to all third-group courses.

203–4 *The Theory of Econometrics* (3–3)
A year course: credit is not given for the first half until the second half is completed. Not offered 1962–63. Statistical methods applied to analysis of production, supply, and demand; utility and disutility; interest and taxation; exchange. Emphasis on interpretation of results in terms of probability, correlation, and regression of time series. Admission by permission of the instructor.

205–6 *Advanced Business and Economic Statistics* (3–3)
Not offered 1962–63. Application of statistical methods to specific problems utilizing case method when possible. Emphasis on source materials, role of statistical methods, techniques of analysis, interpretation and presentation of results. Original work is required of each student. Prerequisite: Statistics 112 or the equivalent.

207 *Operations Analysis* (3) Bright
Fall—evening. Basic concepts and techniques of operations analysis as applied to problems in business management and economic research. An introduction to the processes of linear programming, game theory, and queueing theory. Admission by permission of the instructor.

211 *Theory of Sampling* (3) Bright
Spring—evening. Problems of sampling and sample design. Admission by permission of the instructor.

212 *Nonparametric Statistical Inference* (3)
Not offered 1962–63. Spring—1964. Statistical inference when the form of the underlying distribution is unknown; sign tests; rank order statistics; theory of runs; nonparametric discriminant analysis.

217 *Analysis of Variance II* (3)
Not offered 1962–63. Advanced theory of the applications of the linear hypothesis to research problems. Distributions of the analysis of variance. Extensions to multiple classifications with unequal cell frequencies. Studies of multiple contrasts and their importance. Normal versus non-normal problems.

218 *Correlation and the Chi-square Test II* (3)
Not offered 1962–63. Spring 1965. Theoretical analysis of simple, partial, and multiple regression. Examination of various distributions encountered. Rank correlation techniques and their distributions. Distribution of the chi-square statistic.

257–58 *Advanced Mathematical Statistics* (3–3) Kupperman
Academic year—evening. Random variables and probability distributions, distribution functions and their properties, convergence theorems, regression and correlation, multivariate normal distribution, asymptotic and exact sampling distributions, estimation, hypothesis testing.

259–60 *Advanced Mathematical Probability* (3–3) Kullback
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Modern theories and asymptotic laws: elementary theory of definite integration; limit theorems in probability.

261–62 *Information Theory for Engineers* (3–3) Kullback
Academic year—evening. The elements of information theory and its statistical and probabilistic background from an elementary point of view (nonmeasure theoretic). Measures of information, entropy, and their properties. Discrete stochastic sources, message ensembles. The transmission of information, channels, channel capacity. Encoding and decoding including error detection and correction. The fundamental theorems of information theory.

263–64 *Statistical Inference* (3–3) Greenhouse
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Sample space; methods for estimating population parameters; fiducial inference and its application to testing hypotheses; valid, efficient, and exact estimation; Student's distribution; variance distribution; sampling statistics. Prerequisite or concurrent registration: Statistics 257–58 or the equivalent.

265–66 *Multivariate Analysis* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Tests of significance, generalized variance and covariance, tests of independence, canonical and vector correlations, multivariate, normal distribution, generalized Student's ratio, problems of estimation, applications to factor analysis.

267–68 *Characteristic Functions* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Fourier integrals, set functions, inversion formulas, limit theorems, applications to the distribution problem in statistics.

269 *Sequential Testing* (3)
Not offered 1962–63.

270 *Statistical Decision Theory* (3)
Not offered 1962–63.

271–72 *Statistical Information Theory* (3–3)
A year course, credit is not given for the first half until the second half is completed. Not offered 1962–63. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shanon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing. Asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison or experiments.
Kullback

273–74 *Stochastic Processes* (3–3)
A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Fundamental notions of stochastic processes; random walks; Markov processes; differential processes; Gaussian processes; applications.
The Staff

295–96 *Reading and Research* (3–3)
Academic year—as arranged. Admission by permission of the instructor.
The Staff

299–300 *Thesis* (3–3)

Courses Offered in Special Programs

In addition to the regular courses announced above the University offers the following courses for students enrolled in the following special programs: Navy Graduate Financial Management Program, Air Force Advanced Management Program, Engineering Administration, and Hospital Administration.

101 *Basic Principles of Statistical Methods* (3)
Variables and attributes, averages and dispersion, elementary principles of sampling, introduction to the making of statistical decisions.

119 *The Bases of Statistical Decision Making* (ATT.)
Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.

120 *Principles of Statistical Analysis* (3)
Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses.

262 *Managerial Statistics and Quality Control* (3)
The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

ZOOLOGY*

Professors I. B. Hansen *(Chairman)*, Edith Mortensen, P. W. Bowman, S. C. Munson
Professorial Lecturer K. C. Kates
Associate Professor A. H. Desmond
Lecturer J. R. Buchheit

Bachelor of Arts or *Bachelor of Science (Field-of-Study).*—Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32, including Biology 1–2† and Chemistry 11–12.

Required: the general requirements, pages 37–42, and the grade "pass" on the Zoology major examination at the end of the senior year. The correlated knowledge upon which the student will be examined includes the following fields: (1) classification, structure, and ecological relations of animals, both invertebrate and vertebrate; (2) embryological development and life histories of important animal types; (3) general principles of physiology, heredity, and evolution; (4) the development of biological principles, hypotheses, and theories as revealed in the study of the history of zoology.

Bachelor of Arts or *Bachelor of Science with a major in Biology (Departmental).*—This interdepartmental major may be arranged in conjunction with the Department of Botany. Prerequisite: the Arts and Letters or the Science curriculum, respectively, page 32, including Biology 1–2†, or the equivalent.

Required: in addition to the general requirements, pages 37–42, a minimum of twenty-four semester hours of second group courses in Zoology and Botany, as approved by the chairman of either Department.

Master of Arts or *Master of Science in the field of Zoology.*—Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Zoology or Biology.

Required: the general requirements, pages 43–45.

Master of Arts or *Master of Science in the field of Biology.*—This interdepartmental field may be arranged in conjunction with the Department of Botany. Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Zoology, Botany, or Biology.

Required: the general requirements, pages 43–45.

Doctor of Philosophy (Graduate Council).—See the pamphlet on the Graduate Council.

BIOLOGY ‡

First Group

1-2 *Introductory Biology*† (4–4) — **The Staff**

An interdepartmental course. Lecture (2 hours), laboratory (4 hours).

Biology 1—Plant Sciences (4): fall—day and evening; spring—day and evening.

Biology 2—Animal Sciences (4): fall—day and evening; spring—day and evening.

This course is designed to provide the nonscience student with an understanding of the life sciences and to serve as a basis for those who may wish to continue in some aspect of biology. It is the introductory course leading to all second- and third-group courses in botany and zoology, and is taught jointly by the staff members of the two departments. Designed to be taken in either sequence; students may be registered for either 1 or 2 at the beginning of the academic year, depending on laboratory space available. Material fee, $10 a semester.

* The Staff of Instruction here listed is for the academic year 1961-62.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

‡ Biology 1–2 is prerequisite to all second-group courses in Zoology, except by permission of the instructor.

Beginning with the academic year 1962-63, Biology 1–2 *Introductory Biology* (4-4) replaces Botany 1–2 *General Botany* (4-4) and Zoology 1–2 *Introduction to Zoology* (4–4). Botany 1–2 and Zoology 1–2 will be offered for the last time in the summer of 1962.

ZOOLOGY

Second Group*

101–2 *Invertebrate Zoology* (3–3) Mortensen

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. A systematic study of invertebrate forms, including the morphology, classifications, life histories, and phylogenetic relationships. Material fee, $8 a semester.

103–4 *Comparative Vertebrate Anatomy* (3–3) Desmond

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: academic year—day and evening; 1963–64 and alternate years: academic year—day. Lectures on the organ systems of the vertebrates, laboratory dissections of types. Material fee, $11 a semester.

107–8 *Organic Evolution*† (3–3) Bowman

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. A study of the theories of organic evolution and present ideas on the principle lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechanisms involved in this process from the fields of genetics and cytology.

115–16 *Cytology*† (3–3) Bowman

Lecture and laboratory. 1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day; summer 1962—Zoology 115 (3) (as Biology 115). Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Material fee, $8 a semester.

127 *Genetics*† (3)

Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man.

140 *Cell Physiology*† (3) Shropshire

Spring—evening. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12.

145 *Introduction to Vertebrate Embryology* (3) Hansen

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—day and evening; summer 1962. Origin and early development of the individual, formation of organ systems. Emphasis on the frog, chick, and pig, with reference to the human embryo. Material fee, $11.

148 *Histology* (3) Desmond

Lecture (1 hour), laboratory (4 hours). 1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. An introduction to the microscopical anatomy of normal tissues and organs. Material fee, $11.

152 *Protozoa* (3) Mortensen

Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. Introduction to the protozoa: classification, life histories, and physiology, with special emphasis on free-living types. Material fee, $8.

155 *Parasitology* (3) Kates

Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. An introduction to the study of animal parasitology, with a survey of parasitic types from the protozoa through arthropods. Material fee, $11.

161 *Entomology* (3) Munson

Lecture (1 hour), laboratory (4 hours). 1963–64 and alternate years. A study of the elementary morphology, physiology, and ecology of insects, with an introduction to the taxonomy of the more important groups. Material fee, $8.

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* Biology 1–2 is prerequisite to all second-group courses in Zoology, except by permission of the instructor.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

162 *Insect Physiology* (3) Munson
1963–64 and alternate years. Lectures and laboratory work on the physiology of insects. Admission by permission of the instructor. Material fee, $11.

171–72 *Special Problems* (3–3) The Staff
Academic year—as arranged. Written approval of the instructor is required. Material fee, $11 a semester.

199–200 *Proseminar* (3–3) The Staff
Academic year—day and evening. Designed to correlate and supplement the work of Zoology majors.

THIRD GROUP

201–2 *Seminar: Cytology** (3–3) Bowman
Academic year—evening.

204 *Seminar in Invertebrate Zoology* (3) Mortensen
1962–63 and alternate years: spring—evening. A study of original publications on hormones of invertebrate animals.

214 *Advanced Invertebrate Zoology* (3) Mortensen
Not offered 1962–63. Lectures and laboratory work on problems in invertebrate physiology. Prerequisite: Zoology 101–2 or the equivalent. Material fee, $8.

247–48 *Morphogenesis* (3–3) Hansen
1962–63 and alternate years: academic year—evening. Lectures and class reports on experimental morphology. Prerequisite: Zoology 103–4 or the equivalent.

251 *Seminar in Vertebrate Zoology* (3) Desmond
1963–64 and alternate years. A study of current publications in the field of histophysiology.

295–96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1962—Zoology 295 (3). Investigation of special problems.

299–300 *Thesis* (3–3) The Staff
Academic year—as arranged; summer 1962—Zoology 299 (3).

COURSES FROM OTHER DEPARTMENTS

The following courses are of interest chiefly to the preprofessional student who expects to take his upper-division work in one of the professional units of the University and to the student who seeks a two-year terminal degree (Associate in Arts or Associate in Science). Such professional credits do not normally count toward a Bachelor's degree from Columbian College of Arts and Sciences, but a student may, by prior petition, elect up to twelve hours of such work, with the exclusion of Secretarial Studies, which can count only for the terminal degree in that subject.

* An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

ACCOUNTING

1–2 *Introductory Accounting* (3–3) Kennedy and Staff

First half: fall—day and evening; spring—day and evening; summer 1962.
Second half: fall—day and evening; spring—day and evening; summer 1962.
First half: basic principles underlying accounting records, preparation of the work sheet and financial statements, accounting for single proprietorships and partnerships. *Second half:* accounting for corporations and introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

101 *Cost Accounting* (3)

Fall—day and evening; summer 1962. Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; and analysis and interpretation of cost data. Prerequisite: Accounting 1–2.

111 *Financial Statement Analysis* (3) Kennedy, Steele

Fall—day; spring—evening; summer 1962. Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1–2 or permission of the instructor.

121–22 *Intermediate Accounting* (3–3) Eaton, Simpson

Academic year—day and evening. *First half:* valuation and amortization problems of current assets, long term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

161 *Income Tax Accounting* (3) Kurtz, Gallagher

Fall—evening. Problems involved in the federal income taxation of individuals and corporations, differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1–2.

171 *Auditing* (3) Eaton

Fall—evening; spring—day. Duties and responsibilities of auditors; principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121–22.

181 *Accounting Systems* (3) Lewis

Fall—evening. Theory and procedure of designing and installing accounting systems, for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121–22, and 171, or permission of the instructor.

191 *Advanced Accounting* (3) Kurtz, Simpson

Fall—evening; summer 1962. Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121–22.

193 *Business Budgeting* (3) Lewis

Fall—day; spring—evening; summer 1962. Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1–2.

AIR SCIENCE

Commission in the United States Air Force Reserve.—Upon being awarded a Bachelor's degree and upon the satisfactory completion of the Air Force ROTC course of instruction prescribed by law and regulations, the graduate will be appointed Second Lieutenant, United States Air Force Reserve.

Basic Course

1-2 *Leadership Laboratory—Freshman Year* (1–1) **The Staff**
Academic year—day. Cadet basic airman training. Military courtesy, discipline, appearance and bearing; element, flight squadron, and mass formation drill; parades and ceremonies; the military mission and the problem of national security. Minimum 15 hours a semester. Laboratory fee, charged one time a year, $3. (May be substituted for Physical Education 1–2.)

11-12 *Leadership Laboratory—Sophomore Year* (1–1) **The Staff**
Academic year—day. Cadet noncommissioned officer training. Military bearing and courtesy, all phases of drills and ceremonies, command voice training and command responsibility. Prerequisite: Air Science 1–2, 21–22 for men and Air Science 1–2 for women. Political Science 1 or 9 is recommended as an elective during the sophomore year in preparation for Political Science 171 (see Air Science 151–52). Minimum 15 hours a semester. Laboratory fee, charged one time a year, $3. (May be substituted for Physical Education 11–12.)

21 *Air Science—Freshman Year* (2 or 3)
Fall. Any 2 or 3 semester hour introductory college course in the areas of mathematics, physical and natural sciences, foreign languages, the humanities or social sciences approved by the Division of Air Science as meeting the pre-commission officer educational requirements.

22 *Air Science—Freshman Year* (2) **Garrell**
Spring: 2 hours a week—day. General survey of air power to include military instrument of national security, elements and potentials of air power, evolution of aerial warfare, and air vehicles and principles of flight.

51 *Air Science—Sophomore Year* (2) **Garrell**
Fall: 2 hours a week—day. Fundamentals of aerospace weapon systems, including missiles, aircraft, propulsion plants, space vehicles, and operations in space.

52 *Air Science—Sophomore Year* (2 or 3)
Spring. Any 2 or 3 semester hour introductory college course in the areas of mathematics, physical or natural sciences, foreign languages, the humanities or social sciences approved by the Division of Air Science as meeting the pre-commission officer educational requirements. Political Science 1 or 9 is recommended as an elective during the sophomore year in preparation for Political Science 171 (see Air Science 151–52).

Advanced Course

101-2 *Air Science—Junior Year* (1–1) **Gagnier**
Academic year—day. Air Force officer development. Knowledge and skills required of a junior officer in the Air Force. This includes the Air Force commander, his staff, and the air base; the military justice system; and preparation for summer training. Prerequisite or concurrent registration. Business Administration 102 and 193, which are not to be taken in the same semester of the academic year.

103-4 *Leadership Laboratory—Junior Year* **The Staff**
(Credit is a part of Air Science 101–2.)
Academic year—day. Cadet noncommissioned officer and officer training. Wearing of the uniform, parades and ceremonies, commands and command voice. Cadets perform duties involving planning for and supervision of Cadet Corps activities. Emphasis placed on leadership and management proficiency. Minimum 15 hours a semester.

105 *Summer Training Unit—Between Junior and Senior Years* (required) — The Staff

Attendance at a four-week Air Force ROTC summer training unit at an Air Force base within continental United States is mandatory. Program consists of familiarization flying, physical training, individual weapons, Air Force base activity and equipment, field exercises, air base problems, and leadership training.

151–52 *Air Science—Senior Year* (1–1) — Wall

Academic year—day. *First half:* weather and navigation. A study of the weather and navigational aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, and dead reckoning navigation. *Second half:* the Air Force officer. A study of materials to help the cadet make a rapid effective adjustment to active duty as an officer of the United States Air Force. Prerequisite or concurrent registration: Political Science 171 and Geography 146, which are not to be taken in the same semester of the academic year. Only pilot candidates need take weather and navigation. Others may substitute any college course approved by the Division of Air Science.

153–54 *Leadership Laboratory—Senior Year* (Credit is a part of Air Science 151–52) — The Staff

Academic year—day. Cadet officer training. Cadet officers conduct activities of Corps of Cadets through chain of command, instruct subordinates, plan and supervise Cadet Corps training and administration. Preparation for commissioned officer duties. Development of leadership and managerial responsibilities. Minimum 15 hours per semester.

BUSINESS ADMINISTRATION

131 *Business Finance* (3) — Clayton

Fall—day; spring—day and evening. Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1–2.

161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3) — Berns, Collins, McClure

Fall—day and evening.

162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3) — Berns, Collins, Murphy

Spring—day and evening.

HOME ECONOMICS

1 *Food Selection and Preparation* (3)

Not offered 1962–63. Composition, selection, and preparation of food; analysis of recipes; standard products; planning, preparing, serving, and estimating the cost of meals. Material fee, $18. — Towne

22 *Clothing: Its Selection, Cost, and Care* (3)

Not offered 1962–63. Clothing selections—the economic, aesthetic, and hygienic aspects; the application of the principles of color and design to individual selection; the care of clothing. — Osterndorf

51 *Family Meals* (3)

Fall—day. The choice, purchase, preparation, and service of foods; dietary standards, food habits, and the nutritional needs of the family; problems of purchasing, care, and use of food by the consumer. Material fee, $11.

62 *Clothing Construction* (3) Towne
Not offered 1962–63. Simplified techniques and unit method of construction suitable for cotton, wool, silk, and man made fibers; the use of commercial patterns and their alteration; the proper selection of color, design, and fabric. Material fee, $8.

PHYSICAL EDUCATION FOR MEN

1-2 *Freshman Physical Education* (1–1) The Staff
Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,* $4.50 a semester.

11-12 *Sophomore Physical Education* (1–1) The Staff
Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,* $4.50 a semester.

41 *Personal Health* (1) Krupa
Spring—day. Physical, mental, and social health of the individual—understanding, significance, and promotion. Emphasis on personal health knowledges for the future teacher.

43–44 *Techniques of Physical Education Motor Activities* (2–2) DeAngelis, Krupa
Academic year—day. Fundamental skills, rules, and organization. Locker and towel fee,* $4.50 a semester.

45–46 *Teaching Individual and Dual Sports in Secondary Schools* (2–2) Hanken, Krupa
Academic year—day. Tennis, golf, swimming, wrestling, badminton, bowling. Locker and towel fee,* $4.50 a semester.

47 *Introduction to Physical Education* (2) Myers
Fall—day. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field.

49 *Human Anatomy* (3) Stallings
Fall—day. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1–2†.

50 *Kinesiology* (3) Lawrence
Spring—day. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

58 *First Aid and Care of Athletic Injuries* (2) DeAngelis
Spring—day. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1–2†.

* The locker and towel fee is required for registration in one or more of the activity courses.
† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

PHYSICAL EDUCATION FOR WOMEN

1–2 *Freshman Physical Education* (1–1) — The Staff

Academic year: fundamentals of health and physical education—day; activity—day. One period of fundamentals of health and physical education and two periods a week chosen from the activities offered each semester.

Fundamentals of health and physical education: one semester on study of the factors involved in the general maintenance of health, efficient use of the body, and fundamentals of movement; one semester on fundamentals of rhythms.

Activities: badminton, basketball, body mechanics, field hockey, recreational dance, golf, fencing, modern dance, riding, skating, swimming, synchronized swimming, tennis, softball, lifesaving. Locker and towel fee,* $4.50 a semester.

11–12 *Sophomore Physical Education* (1–1) — The Staff

Academic year: two periods a week—day. Two periods a week chosen from the activities offered each season as listed under Physical Education 1–2. Locker and towel fee,* $4.50 a semester.

43–44 *Techniques of Physical Education Motor Activities* (2–2) — The Staff

Academic year—as arranged. Fundamental skills, rules, and organization. Locker and towel fee,* $4.50 a semester.

49 *Human Anatomy* (3) — Stallings

Fall—day. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1–2†.

50 *Kinesiology* (3) — Lawrence

Spring—day. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

51–52 *Teaching Physical Education Activities* (2–2) — The Staff

1963–64 and alternate years. Team sports: basketball, hockey, softball, soccer, speedball. Individual and dual sports: tennis, badminton, archery, swimming and diving, lifesaving and water safety. Gymnastics: tumbling, apparatus and trampoline. Locker and towel fee,* $4.50 a semester.

SECRETARIAL STUDIES

1 *Elementary Typewriting* (3) — Shott and Staff

Fall—evening; spring—evening. Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms. Laboratory fee, $7.

2 *Intermediate Typewriting* (3) — Shott and Staff

Fall—evening; spring—day and evening. The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents. Prerequisite: Secretarial Studies 1 or the equivalent; ability to type accurately at 30 words a minute. Laboratory fee, $7.

11 *Elementary Shorthand and Transcription* (3) — Shott and Staff

Fall—day and evening; spring—evening. A study of the principles of Gregg shorthand correlated with dictation and transcription. *Minimum* dictation speed of 60 words a minute attained. Laboratory fee, $3.

* The locker and towel fee is required for registration in one or more of the activity courses.

† An interdepartmental course offered by the departments of Botany and Zoology. Students may register in either department.

12 *Intermediate Shorthand and Transcription* (3) Shott and Staff
Fall—evening; spring—day and evening. Review of the principles of Gregg shorthand. Dictation and transcription on general and specialized business subjects. *Minimum* dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute. Laboratory fee, $5.

15 *Advanced Shorthand, Typewriting, and Transcription* (3) Shott
Fall—day. Dictation and transcription involving vocabularies in specific businesses. *Minimum* speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent. Laboratory fee, $5.

16 *Secretarial Shorthand, Typewriting, and Transcription* (3) Shott
Spring—day. Dictation and transcription involving vocabularies used in the legal and medical professions. *Minimum* dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 15 or the equivalent. Laboratory fee, $5.

51 *Business Correspondence* (3) Shott
1962–63 and alternate years: fall—day. 1963–64 and alternate years: fall—evening. Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.

54 *Secretarial Practice* (3) Shott
Spring—day. A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

INDEX

A

Absence, regulations concerning
  See Attendance
Academic status of the University, 3
Accounting:
  Courses in, 145
  Curriculum in, 35, 36
Achievement Tests, 15
Activities, student, 50–52
  See also Special Bulletin
Administration, Officers of, 2
Admission, 13–14
Advanced Placement Examination, 14
  Advanced standing, 14
Advisory system:
  Lower division, 29
  Preprofessional students, 29
Air Force Reserve Officers' Training Corps, 46–47
Air Science, courses in, 145–46
American Literary and Cultural History, Master of Arts field in, 42, 73–74
American Thought and Civilization, major in, 39, 73
Anatomy, courses in, 54–55
Annual events, student, 51–52
Anthropology, courses in, 129–32
Art, courses in, 55–60
Attendance, 24, 28
Auditor, 18, 27
Awards, 22

B

Biochemistry, courses in, 60–61
Biology, courses in, 61, 62, 141
Botany, courses in, 62–64
Buildings of the University, 4
Business Administration:
  Courses in, 146
  Curriculum in, 35, 36
Business and Economic Statistics, lower-division curriculum in, 36

C

Calendar for 1962–63, v
Cartography
  Courses on, 81
    See also Catalogue of the College of General Studies
Changes in program of studies, 27
Chapel, 49
Chemistry, courses in, 64–67
Classical Languages and Literatures, courses in, 68–69
Classification of students, 29
College Entrance Board examinations, 14–15
Colleges, Schools, and Divisions, 3, 12
Commencement
  See Graduation
Commercial Art, courses in, 59
Committees of the Faculty, 11–12
Contents, Table of, iii
Convocation
  See Graduation
Correspondence courses, 28
Counseling Center, 48
Course numbers, explanation of, 54
Courses of Instruction, 54–149
Credit:
  Explanation of amount of, 54
  For Advanced Placement examinations, 14
  For Correspondence and Home Study Courses, 28
  For Professional courses, 38
  For summer school work, 28
  From other institutions, 13, 27–28
  Transfer of, within the University, 27

D

Dance Production Groups, 51
Dean's List, 25
Degrees:
  Associate in Arts, 31, 36–37
    In Accounting, 36
    In Secretarial Studies, 37
  Associate in Science, 36–37
    In Home Economics, 36
    In Physical Sciences, 37
  Bachelor of Arts, 31–33, 37–39
  Bachelor of Science, 31–33, 37–39, 39–41
    In Medical Technology, 32, 33, 41–42
  Combined Bachelor of Arts and Doctor of Medicine, 31–33, 39
  Master of Arts, 42, 43–45
  Master of Fine Arts:
    In Dramatic Art, 42, 43–45, 132
    In Painting and Sculpture, 42, 43–45, 56
  Master of Science, 42–43, 43–45
Departmental Clubs, 53
Dishonesty, regulations concerning, 25
Distinction, degrees with, 25
Distinguished Air Force ROTC Cadet, 26
Distinguished Air Force ROTC Graduate, 26
Dormitories, 48–49
Dramatic Art:
  Bachelor of Arts major in, 132
  Master of Fine Arts field in, 132
Drawing, courses in, 58–59
Dropping courses, 27

E

Economics, courses in, 69–73
Education curriculum, lower division, 34
Educational Facilities of the University, 4
Educational Objectives, 12
Emeritus Faculty, 6
Employed students, amount of academic work, 23
Employment, student, 23, 49–50

English:
Correct use of, 25
Courses in, 73–78
Placement examination, 30
Requirements, 31
Entrance requirements, 14–16
Graduate division, 15–16
Lower division, 14–15
Upper division, 15
Examinations, 24
Advanced Placement, 14
College Entrance Board, 14–15
For admission, 14–15
For placement in language courses, 30
For qualifying for advanced standing or waiving curriculum requirements, 31, 38
Graduate Record, 39
Physical, 31

F

Faculty:
Alphabetical list, 6–11
Committees, 11–12
Fees and financial regulations, 16–19
Fellowships, 19–20
Financial aid, 23
Foreign language:
Examination:
For Master's candidacy, 44
Placement, 30
Requirements, 31
Foreign students, 50
Fraternities, 53
French, courses in, 121–23
Examinations:
For Master's candidacy, 44
Placement, 30

G

Geography, courses in, 78–81
Geology, courses in, 82–84
Germanic Languages and Literatures:
Courses in, 84–86
Examinations:
For Master's candidacy, 44
Placement, 30
Glee Club, 51
Government of the University, 3
Grades, 24
Graduate Division, 15–16, 42–45
Graduate Record Examinations, 28, 39
Graduate study, 42–45
Graduation:
Application for, 28
Dates
See University Calendar
Requirements, 28
Greek, courses in, 68, 69

H

Health services, student
See Health Administration, 47
Hebrew, courses in, 69
History, courses in, 86–91
Home Economics:
Associate in Science curriculum in, 36
Courses in, 146–47
Lower-division curriculum in, 34
Home study courses, 28
Honor Roll, 25
Honor Societies, 52–53
Honors, 25–26
Hospitalization, 47
Hours of instruction, 54

I

Independent study plan, 38–39
"In residence status", 16, 17, 28
International Affairs, lower-division curriculum in, 35–36
International House, 50
Italian, graduate courses in, 127

J

Journalism, courses in, 91–92

L

Language placement examinations, 30
Language requirements, 31
Latin:
Courses in, 68, 69
Major in, 68
Latin America, courses on, 71, 72, 80, 89, 90, 109, 110, 111
Latin American Civilization:
Bachelor of Arts major in, 87
Master of Arts field in, 87
Leave of absence, 16, 37–38
Library, 5, 28
Hours, 5
Law, 5
Medical, 5
Regulations, 28
Loan Funds, 23
Location of the University, 3
Lost and Found Office, 29
Lower Division, 14–15, 29–37

M

Major fields, 39–41
Mathematics, courses in, 92–96
Medical Privileges, 47
Medical Technology:
Bachelor of Science degree in, 41–42
Courses in, 98–99
Curriculum in, 33
Microbiology, courses in, 96–98
Military honors, 26
Music, courses in, 59–60

O

Objectives, educational, 12
Organizations, student, 52–53

P

Painting:
Courses in, 58–59
Master of Fine Arts field in, 56

Pathology, courses in, 98–99
Pharmacology, courses in, 99–100
Pharmacy, lower-division curriculum in, 33
Phi Beta Kappa, 52
Philosophy, courses in, 100–102
Physical Education:
  Courses in:
    For men, 147
    For women, 148
  Lower-division curricula in:
    For men, 34–35
    For women, 35
  Requirements, 30–31
Physical examinations, 31
Physics, courses in, 102–5
Physiology, courses in, 105–6
Placement:
  Office, 50
  Tests, 30
    SEE ALSO University Calendar
Political Science, courses in, 107–11
Premedical curriculum, 33
Prizes, 22
Probation, 26
Professional organizations, 53
Property, responsibility for, 29
Psychology, courses in, 111–17
Public Affairs, Lower-division, curriculum in, 35–36
Publications, student, 53

Q

Qualifying examinations, 38
  SEE ALSO in University Calendar
Quality-point index, 24

R

Reading Clinic, 48
Readmission, 13–14
Refunds, 18–19
Registration, 16
Regulations, 23–29
Religion, courses in, 117–20
Religious Education, Master of Arts field in, 118
Religious organizations, 53
Reserve Officers' Training Corps:
  Air Force Unit, 46–47
Residence:
  Halls, 48–49
  Requirements, 16, 28, 37–38
Romance Languages and Literatures, courses in, 120–27
  Examinations:
    For Master's candidacy, 44
    Placement, 30
  French, courses in, 121–23
  General courses, 126–27
  Spanish, courses in, 123–26
Rules of the University, right to change, 29
Russia, courses on, 72, 80, 88, 90
Russian, courses in, 127–28

S

Scholarship, 24, 28
Scholarships, 20–22
Scholastic Aptitude tests, 30
Sculpture:
  Courses in, 58–59
  Master of Fine Arts field in, 56
Secretarial Studies:
  Courses in, 148–49
  Vocational curriculum in, 37
Self Help, 49–50
Semester hours:
  Explanation of, 54
  Maximum allowed full- and part-time students, 23
Sigma Xi, 52
Slavic Languages and Literatures, courses in, 127–28
Sociology and Anthropology, courses in, 129–32
Sororities, 53
South America, courses on
  SEE Latin America
Spanish, courses in, 123–26
  Examinations:
    For Master's candidacy, 44
    Placement, 30
Speech, courses in, 132–35
Staff of Instruction, alphabetical list, 6–11
Statistics, courses in, 136–40
Student:
  Activities, 50–52
    SEE ALSO Special Bulletin
  Employment, 23, 49–50
  Life, 48–53
  Organizations, 52–53
  Publications, 53
  Union, 49
Summer Sessions, 3
Suspension, 26

T

Testing Center, University, 48
Theater, courses on, 134, 135
Thesis, requirements for, 44–45
Transcripts of record, 13, 27–28
Transfer within the University, 27
Trustees, Board of, 1
Tuition, 16

U

Upper Division, 15, 37–42

V

Veterans Education, 45

W

Warnings, 26
Withdrawal, 18–19, 26–27

Z

Zoology, courses in, 141–43

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Columbian College of Arts and Sciences: Associate in Arts (A.A.), Associate in Science (A.S.), Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)

Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

National Law Center:

Law School: Bachelor of Laws (LL.B.)

Graduate School of Public Law: Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)

School of Engineering: Engineering Technologist Certificate (Eng. Tech. Cert.), Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)

School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: Associate in Arts (A.A.), Associate in Science (A.S.), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.)

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

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Columbian College of Arts and Sciences.....Director of Admissions
Fellowships, Scholarships, Prizes,
Financial Aid.....Chairman, Committee on Scholarships
General Catalogue of the University.....Director of Admissions
Graduate Council.....Dean of the Graduate Council
Law School.....Director of Admissions
School of Education.....Director of Admissions
School of Engineering.....Dean of the School of Engineering
School of Medicine.....Director of Admissions
Summer Sessions.....Dean of the Summer Sessions
Schedule of Classes: Fall and Spring Semesters.....Registrar
Schedule of Classes: Summer Sessions.....Dean of the Summer Sessions

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1960

THE LAW SCHOOL, 1865

THE GRADUATE SCHOOL OF PUBLIC LAW, 1960

THE SCHOOL OF ENGINEERING, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF SPECIAL STUDENTS, 1944

THE DIVISION OF AIR SCIENCE, 1951

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

The George Washington University

Bulletin



THE LAW SCHOOL
1962-63

WASHINGTON 6, D. C.
DECEMBER 1961
Vol. LXI No. 4

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

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Alumni Association.....Alumni Office, Bacon Hall

Foreign Students.....Adviser to Foreign Students, Building T

Graduate Study

In Arts and Sciences

Master's degrees.....Dean of Columbian College of Arts and Sciences

Doctor of Philosophy.....Dean of The Graduate Council

In Education.....Dean of The School of Education

In Engineering.....Committee on Graduate Studies, School of Engineering

In Law.....Dean of The Graduate School of Public Law

In Accounting, Business Administration, Business and Economic Statistics, Economic Policy, Hospital Administration, International Affairs, Personnel Administration, Public Administration, Public Affairs.....Dean of The School of Government, Business, and International Affairs

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Women.....Director of Women's Activities, Woodhull House

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Transcripts of Records.....Registrar, Building C

Veterans Education.....Director of Veterans Education, Building Q



View of the Yard from the Law School Library



The Large Class in Contrast

The George Washington University

Bulletin

THE LAW SCHOOL
1962-63

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CONTENTS

	Page
Calendar of the Law School	v
The University	1
The Board of Trustees	1
Officers of Administration	2
History and Organization	2
Academic Status	3
Location	3
The Law School	3
The Faculty and Staff of Instruction	3
History	6
Location in the Nation's Capital	7
Objectives	8
The Bachelor of Laws Program	8
The Graduate School of Public Law	12
Faculty	12
Programs of Study	12
Entrance Requirements	13
Requirements for the Degrees	14
General Information	15
Application for Admission	16
Registration	17
Fees and Financial Regulations	17
Fellowships, Scholarships, Prizes, Loan Funds	19
Regulations	21
Student Activities and Services	24
Courses of Instruction	27
Degrees Conferred, February, June, and October, 1961	35
Students Registered, Spring, Summer, and Fall, 1961	40
Summaries of Registration, Spring 1960–61, Summer 1961, Fall 1961–62	59
Index	63

1962

July

S	M	T	W	T	F	S
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August

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September

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October

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November

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December

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August

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September

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October

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November

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December

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CALENDAR

1962–63

Summer Term:

Registration for both sessions	June 11	Mon.
First session begins	June 12	Tues.
Independent Day. Holiday	July 4	Wed.
Last day of classes	July 23	Mon.
First session examination period	July 24–26	Tues.–Thurs.
Registration for students attending second session only	July 27	Fri.
Second session begins	July 30	Mon.
Labor Day. Holiday	Sept. 3	Mon.
Last day of classes	Sept. 7	Fri.
Second session examination period	Sept. 10–12	Mon.–Wed.

Fall Semester:

Registration*	Sept. 20–22	Thurs.–Sat.
Classes begin	Sept. 24	Mon.
S.J.D. dissertations of Feb. candidates due in Dean's Office	Oct. 5	Fri.
Application for Feb. graduation due in Registrar's Office	Oct. 31	Wed.
Veterans Day. Holiday	Nov. 12	Mon.
Thanksgiving recess	Nov. 22–24	Thurs.–Sat.
Christmas recess	Dec. 22–Jan. 2	Sat.–Wed.
Classes resume	Jan. 3	Thurs.
Last day of fall-semester classes	Jan. 19	Sat.
Examination period	Jan. 21–29	Mon.–Tues.

Spring Semester:

Registration*	Jan. 31–Feb. 2	Thurs.–Sat.
Spring-semester classes begin	Feb. 4	Mon.
S.J.D. dissertations of June candidates due in Dean's Office	Feb. 8	Fri.
Winter Convocation. Holiday	Feb. 22	Fri.
Application for June graduation due in Registrar's Office	Feb. 28	Thurs.
Application for 1963–64 scholarships due	March 1	Fri.
Application for 1963–64 Teaching Assistantships due	March 15	Fri.
Easter recess	April 12–17	Fri.–Wed.
Application for Research Assistantships due	May 1	Wed.
Last day of spring-semester classes	May 18	Sat.
Examination period	May 20–28	Mon.–Tues.
Memorial Day. Holiday	May 30	Thurs.
Baccalaureate Service	June 2	Sun.
Commencement	June 5	Wed.

* Registration will be held from 12:00 to 8:00 P.M., September 20 and 21 for the fall semester, January 31 and February 1 for the spring semester; from 10:00 A.M. to 1:00 P.M., September 22 for the fall semester, and February 2 for the spring semester.

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HISTORY AND ORGANIZATION OF THE UNIVERSITY

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of Columbian College of Arts and Sciences, which offers work leading to the Bachelor's and Master's degrees and two-year preprofessional and terminal curricula; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine; Law; Engineering; Pharmacy; Education; and Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

* For the academic year 1961–62.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Within a few blocks are the buildings housing the offices of many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor. Also readily accessible are the Capitol, the Library of Congress, the National Archives, the Supreme Court, and other federal courts.

THE LAW SCHOOL

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A.B. 1911, LL.B. 1915, S.J.D. 1932, Harvard University

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A.B. 1903, University of the South; LL.B. 1906, Georgetown University

JAMES OLIVER MURDOCK, *Professor Emeritus of Law*
Ph.B. 1916, University of Chicago; LL.B. 1924, Harvard University

ALVIN LEROY NEWMYER, *Professor Emeritus of Law*
LL.B. 1906, The George Washington University

* The President of the University, the Dean of Faculties, the Dean of the National Law Center, the Dean and Assistant Dean of the School, the Assistant Dean for Development in the National Law Center, the Registrar of the University, the Director of Admissions of the University, Professors, Adjunct Professors, Associate Professors, and Assistant Professors constitute the Faculty.
Faculty and Staff of Instruction for the academic year 1961–62.

ACTIVE FACULTY

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A.B. 1946, Dartmouth College; LL.B. 1949, Western Reserve University; LL.M. 1959, Yale University

EDWARD ABBOT BEARD, *Professorial Lecturer in Law*
LL.B. 1939, Georgetown University; Judge, Municipal Court for the District of Columbia

CARVILLE DICKINSON BENSON, *Professor of Law; Assistant Dean of the Law School*
A.B. 1920, Johns Hopkins University; LL.B. 1923, S.J.D. 1926, Harvard University

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Member of the bar of the District of Columbia

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B.S. 1932, University of Pennsylvania; LL.B. 1938, The George Washington University; LL.M. 1942, Georgetown University

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B.S. 1920, United States Naval Academy; LL.B. 1935, Sc.D. 1961, The George Washington University; LL.D. 1946, Muhlenberg College; LL.D. 1958, Dickinson College

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Ph.M. 1931, University of Wisconsin; J.D. 1934, University of Michigan

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A.B. 1921, LL.B. 1923, Dalhousie University; LL.M. 1924, S.J.D. 1929, Harvard University

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A.B. 1943, Ph.D. 1947, Syracuse University; LL.B. 1956, The George Washington University

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A.B. 1929, LL.B. 1931, The George Washington University

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A.B. 1951, LL.B. 1954, LL.M. 1956, Harvard University

WILLIAM THOMAS FRYER, *Professor of Law*
A.B. 1922, LL.B. 1924, The George Washington University; J.D. 1925, Yale University

GEORGE JOSEPH GOLDSBOROUGH, *Associate Professorial Lecturer in Law*
B.S. 1947, United States Military Academy; J.D. 1950, The George Washington University

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LL.B. 1938, University of Texas

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A.B. 1948, Harvard University; LL.B. 1951, University of Virginia

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A.B. 1942, J.D. 1948, University of Chicago

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A.B. 1938, Wofford College; LL.B. 1942, Duke University

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A.B. 1932, Cornell University; LL.B. 1939, S.J.D. 1942, Brooklyn Law School; LL.M. 1948, The George Washington University

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A.B. 1927, Virginia Military Institute; LL.B. 1930, Harvard University; Judge, United States District Court for the District of Columbia

MURDOCK HEAD, *Professorial Lecturer in Forensic Medicine; Chairman, Forensic Medicine Institute*
D.D.S. 1947, University of Louisville; M.D. 1953, University of Vermont; LL.B. 1958, The George Washington University

PHILIP FIELD HERRICK, *Professorial Lecturer in Law*
A.B. 1929, Williams College; LL.B. 1933, LL.M. 1936, The George Washington University

JOHN WINGFIELD JACKSON, *Adjunct Professor of Law*
B.S. 1928, University of Pennsylvania; LL.B. 1932, The George Washington University

JOHN ALEXANDER KENDRICK, *Clerk of the Trial Practice Court*
A.B. 1942, LL.B. 1943, The George Washington University

WILLIAM WALLACE KIRKPATRICK, *Associate Professor of Law*
A.B. 1934, LL.B. 1938, Harvard University

ROBERT KRAMER, *Professor of Law; Dean of the Law School*
A.B. 1935, LL.B. 1938, Harvard University

GUST ANGELO LEDAKIS, *Associate Professor of Law*
B.B.A. 1953, LL.B. 1955, University of Washington; S.J.D. 1958, University of Michigan

HERBERT JOSEPH LIEBESNY, *Associate Professorial Lecturer in Law*
J.D. 1935, University of Vienna

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A.B. 1940, University of Washington; LL.B. 1948, Vanderbilt University

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A.B. 1928, LL.D. 1954, Wittenberg College; LL.B. 1931, University of Cincinnati

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A.B. 1938, LL.B. 1941, University of Minnesota; M.P.A. 1942, S.J.D. 1956, Harvard University

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A.B. 1938, Willamette University; LL.B. 1949, Stanford University; J.S.D. 1959, Yale University

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A.B. 1928, LL.B. 1930, LL.M. 1934, The George Washington University

RALPH CLARKE NASH, JR., *Associate Professor of Law; Director of the Government Contracts Programs*
A.B. 1953, Princeton University; J.D. 1957, The George Washington University

CHARLES BERNARD NUTTING, *Professor of Law; Dean of the National Law Center*
A.B. 1927, J.D. 1930, State University of Iowa; LL.M. 1932, S.J.D. 1933, Harvard University; LL.D. 1957, University of Pittsburgh; Litt.D. 1957, Geneva College; L.H.D. 1957, Seton Hill College; LL.D. 1960, Dickinson College of Law

EDWARD ANDREW POTTS, *Lecturer in Law; Assistant Dean for Development in the National Law Center*
A.B. 1949, University of Michigan; LL.B. 1952, The George Washington University

IRVIN HAROLD RIMEL, *Lecturer in Law*
B.S. 1934, University of Illinois; J D. 1942, The George Washington University

GEORGE NELSON ROBILLARD, *Professorial Lecturer in Law*
B.S. 1924, United States Naval Academy; LL.B. 1930, St. John's University School of Law

PAUL ARCHIBALD ROSE, *Associate Professorial Lecturer in Law*
LL.B. 1930, Washington College of Law

DAVID EARL SEIDELSON, *Assistant Professor of Law; Faculty Editor-in-Chief of the Law Review*
A.B. 1951, LL.B. 1956, University of Pittsburgh

DAVID JAMES SHARPE, *Assistant Professor of Law*
A.B. 1950, University of North Carolina; LL.B. 1955, Harvard University

DUDLEY GRAHAM SKINKER, *Associate Clerk of the Trial Practice Court*
LL.B. 1940, The George Washington University

JOHN PAUL SULLIVAN, *Assistant Professor of Law; Associate Faculty Editor of the Law Review*
A.B. 1952, Boston College; Ph.B. 1953, St. John's Seminary; LL.B. 1958, Georgetown University

RALPH JASON TEMPLE, *Assistant Professor of Law*
B.B.A. 1953, University of Miami; LL.B. 1956, Harvard University

ORVILLE HASSLER WALBURN, *Professor of Law*
A.B. 1925, Franklin and Marshall College; LL.B. 1930, University of Pennsylvania; J.D. 1932, Georgetown University

LEONARD PATRICK WALSH, *Professorial Lecturer in Law*
A.B. 1927, University of Minnesota; LL.B. 1933, National University; Judge, United States District Court for the District of Columbia

*DAVID BENSON WEAVER, *Professor of Law*
A.B. 1943, Ohio Wesleyan University; LL.B. 1948, Western Reserve University

GLEN EARL WESTON, *Professor of Law*
B.S. 1943, University of Maryland; LL.B. 1948, The George Washington University

CHARLES JAMES ZINN, *Professorial Lecturer in Law*
A.B. 1927, LL.B. 1930, Fordham University; LL.M. 1951, S.J.D. 1954, Georgetown University

ASSISTANTS

WILLIAM MONTGOMERY CHAMPION, *Teaching Fellow*
B.S. 1953, Mississippi State College; LL.B. 1961, University of Mississippi

JOHN CHARLES LYONS, *Teaching Fellow*
A.B. 1952, University of Rhode Island; LL.B. 1960, Georgetown University

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HISTORY OF THE LAW SCHOOL

The Law School, the oldest in the District of Columbia, was established in 1865 with a formal program of two years of study. This was largely through the efforts of the Reverend George Whitefield Samson, President of Columbian College, whose action resulted in the purchase of a separate building for holding law classes. This building had belonged to Trinity Church of which Francis Scott Key had been Senior Warden. It was occupied by the Law School until 1884.

* On leave of absence 1961–62.

Sixty graduates, from twenty-two of the then thirty-seven states, received degrees in 1867. The School continued to have a student body and a faculty which reflected the fact that it was at the seat of our nation's government. Associate Justices David J. Brewer and John Marshall Harlan of the Supreme Court of the United States were among the prominent members of the bench and bar who served as lecturers.

In 1877, one year after the first such program was adopted in the United States, the Law School instituted a course leading to the degree of Master of Laws. In 1898 the course of instruction for the degree of Bachelor of Laws was extended to three years. The School took part in 1900 in the organization of the Association of American Law Schools. Later women students were admitted and in 1916 the first woman to take a regular course in law was graduated.

The Law School moved into its present quarters in 1925, marking the occasion with a dedicatory address by Dean Roscoe Pound. The building, Stockton Hall, is named for Rear Admiral Charles H. Stockton, President of the University from 1910 to 1917.

In the past quarter-century the Law School has developed its course and seminar offerings with consideration for the needs of first-degree and graduate students. The degree of Doctor of Juridical Science was instituted in 1940. The needs of foreign lawyers who come to this country and who require additional preparation for law work in the United States resulted in the creation of programs for the degrees of Master of Comparative Law in 1946 and Master of Comparative Law (American Practice) in 1951.

National University, which had had an important place in legal education in the District of Columbia since 1869, was merged in The George Washington University in August 1954.

Programs of special research and study, such as the independent Patent, Trade-Mark, and Copyright Foundation, give richness to the basic curriculum of the Law School.

After years of planning, the National Law Center of The George Washington University, including the Law School and the Graduate School of Public Law, was inaugurated on February 1, 1960, with Dr. Charles B. Nutting as Dean.

LOCATION IN THE NATION'S CAPITAL

Of special significance is the location of the Law School in the Nation's Capital, the focal point of the law in action, both American and international. The work of the School goes on in this environment, presenting a unique opportunity for observation and study of federal agencies—judicial, legislative, and administrative. Readily accessible are the Supreme Court of the United States, the federal trial and appellate courts of the District of Columbia, and, in addition, federal courts of special jurisdiction, such as the United States Court of Claims, the United States Court of Customs and Patent Appeals, and the Tax Court of the United States. Current federal legislation can be studied as it is considered by Congressional committees and as it comes up for debate on the floors of the House of Representatives and the Senate. With respect to the federal administrative agencies, students here in Washington have matchless opportunities for study and observation. They can attend informal and formal hearings of these agencies and can obtain from the docket sections complete records of administrative adjudication in specific cases. Illustrative of such federal agencies are the Interstate Commerce Commission and the Civil Aeronautics Board in the field of transportation; the Federal Trade Commission in the field of trade regulation; the Securities and Exchange Commission in the field of security issues and

corporate finance; the National Labor Relations Board in the field of labor-management relations; the United States Patent Office in the field of patent law; the Federal Power Commission in the field of water, natural gas, and electric power; and the Federal Communications Commission in the field of radio and television.

Supplementing these environmental advantages of law in action are the exceptional research library collections in the Library of Congress, in the various departments of the Federal Government, and in the libraries of the headquarters of national and international organizations located in Washington. The notable library of the Carnegie Foundation for International Peace has been acquired by The George Washington University for use of research students in international and comparative law, fields with respect to which Washington has come to be called "The Capital of the World".

The years of residence at law school are years of participation in the life of the community, which in the case of The George Washington University Law School, is the government of the United States. As a consequence, the study of law takes on added meaning, whether the goal be government service or practice, general or specialized, and whatever the community in which the student plans to practice.

OBJECTIVES

The primary purpose of the Law School is to prepare men and women to meet the needs of society in the many fields of law, public and private. These needs call not only for technical skill but also for responsible leadership in the development of the law and the administration of justice. In fulfilling these responsibilities the Law School offers: (1) a program of study in preparation for the practice of law; (2) programs of study and research on the graduate level for foreign as well as for American students; (3) a continuing legal education program for members of the bar, (4) institutes and forums on current topics in domestic and foreign law; (5) the publication of a law journal containing the results of research in public law; and (6) the encouragement of student professional co-curricular activities.

THE BACHELOR OF LAWS PROGRAM

The wide geographical distribution of the students who come to the Nation's Capital to study law (see Summaries of Registration, page 59) makes for a truly national law school. Students from almost every state in the Union here join students from several foreign countries in their legal training. The basic curriculum leading to the Bachelor of Laws degree is addressed to the development and application of legal principles, skills, and ideals which are indispensable to the equipment of a lawyer for professional responsibility and leadership in modern society. It includes, first and foremost, the traditional core of legal education, namely, the study of legal materials—judicial, statutory, and administrative—and instruction in the understanding and technique of their use. It also includes the study of the nature and purpose of law, the history of the Anglo-American legal system, and the history and standards of the legal profession; practice in the skills of legal research and legal writing; elementary training in trial and appellate practice; and, through the medium of seminars, experience in group handling of legal problems.

ENTRANCE REQUIREMENTS

For the Degree of Bachelor of Laws.—An approved Bachelor of Arts or equivalent degree from an accredited college or university; a satisfactory quality of work; and

an acceptable distribution of courses are required. Eligibility is based on personal and scholastic records and on the result of the Law School Admission Test. No applicant will be accepted who is ineligible to return in good standing to a previously attended law school. From the applicants, a selection is made by the Committee on Admissions.

Information concerning the Law School Admission Test may be obtained from the Dean of the Law School or from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey. The test is administered at various centers of the United States in February, April, August, and November each year. Completed application blanks and fees must be received by the Educational Testing Service at least two weeks before the date of the test. It is not necessary that formal application for admission to the Law School be made prior to taking the test.

Advanced Standing

Advanced standing toward the degree of Bachelor of Laws is granted only for work successfully completed in other law schools which are members of the Association of American Law Schools. Transferred credits will not be recognized in excess of those which might be earned in a similar period in this Law School.

Advanced standing will not be granted for law work already counted toward the Bachelor of Arts or other pre-legal degree.

Unclassified Students

A degree candidate in good standing at another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student to earn credits for transfer to the other law school.

REQUIREMENTS FOR THE DEGREES*

To be recommended for the degree of Bachelor of Laws (LL.B.) the student must have completed a residence period of not less than three academic years (four years for evening students) and 80 semester hours of required and elective courses, with a cumulative average of at least *C*. At least one academic year of residence and 28 semester hours are required of students admitted with advanced standing. Credits allowed by way of advanced standing are not included in computing the average required for graduation.

The degree of Bachelor of Laws "with distinction" is awarded students who obtain a minimum cumulative average of 85.

Graduation Requirements.—See pages 21–22 for a statement of the graduation requirements.

Residence

Candidates for the degree of Bachelor of Laws must complete a residence period of three academic years. Attendance in the day division for the fall and spring semes-

*The degree of Juris Doctor (J.D.) is conferred as a recognition of the completion at The George Washington University Law School, with high rank, of the required program of study for the Bachelor's degree, including experience in research and legal authorship. To be recommended for this degree the student must have completed: (1) a residence period of not less than three academic years (four years for evening students); (2) 80 semester hours with a cumulative average of at least *B* including one of the following courses: Comparative Law I, Jurisprudence, or one of the graduate seminars; and (3) one year of acceptable service on the board of student editors of *The George Washington Law Review*, election to which is subject to regulations laid down by the Faculty. All requirements for the degree must be completed at this Law School.

This degree is available only to students who entered the Law School prior to September 1961.

ters constitutes residence for an academic year; similar attendance in the evening division constitutes residence for three-fourths of an academic year. Consequently, a day student must attend 6 semesters to meet residence requirements, an evening student must attend 8. Students authorized to take schedules of less than 10 hours in the day division or less than 6 hours in the evening division receive residence credit on a proportional basis. Students who attend the summer sessions receive fractional residence credit. For details, see page 15.

Curriculum

Required and Elective Courses.—A program of required and elective courses has been developed to assure coverage of the basic courses and allow a degree of flexibility to meet the diverse interests of students. All first-year courses, four second-year courses, and one third-year course are required, leaving a total of 35 hours of electives. In general, second-year students are restricted to second-year electives but in appropriate cases the taking of third-year electives will be approved. Similarly, specially qualified third-year students may secure approval to take graduate courses and research in public law. It is important that students plan ahead regarding their electives.

Practice and Trial Practice Court.—Classroom instruction is conducted in pleading and procedure, trial and appellate practice, and evidence. This instruction includes grounding in the principles of the Federal Rules of Civil Procedure and the Federal Rules of Criminal Procedure. In addition, each senior student is required to participate in the work of the Trial Practice Court, which includes the trying of cases as junior counsel and as senior counsel. A special section of the court is devoted exclusively to the trial of patent cases. Experience in preparing and arguing appellate court cases is available through the course in Appellate Practice and Procedure and the Case Club Competition.

Patent Law.—Students interested in patent law should take the following group of courses: Unfair Trade Practices, Patent Law, Patent Office Practice, Patent Trial Practice Court, and Federal Antitrust Laws. Additional courses recommended are Advanced Topics in Patent Law and Trade Regulation Seminar.

Curriculum.—Following is the curriculum for students beginning in the fall semester. Adjustments are made to meet the needs of students beginning in the spring semester.

Day Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Constitutional Law	4
Legal Method and Legal System	4	Contracts II	2
Personal Property	2	Criminal Law and Procedure	4
Torts	4	Real Property	4
Total	14	Total	14

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Administrative Law	3
Conveyances	2	Evidence	4
Electives	8	Electives	7
Total	14	Total	14

THIRD YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Trial Practice Court	2	Trial Practice Court	2
Electives	10	Electives	10
Total	12	Total	12

Evening Division

FIRST YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Contracts I	4	Contracts II	2
Legal Method and Legal System	4	Criminal Law and Procedure	4
Personal Property	2	Torts	4
Total	10	Total	10

SECOND YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Civil Procedure	4	Constitutional Law	4
Real Property	4	Conveyances	2
Electives	2	Electives	4
Total	10	Total	10

THIRD YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Administrative Law	3	Evidence	4
Electives	7	Electives	6
Total	10	Total	10

FOURTH YEAR

FALL SEMESTER	Semester Hours	SPRING SEMESTER	Semester Hours
Trial Practice Court	2	Trial Practice Court	2
Electives	8	Electives	8
Total	10	Total	10

THE GRADUATE SCHOOL OF PUBLIC LAW*

Louis Harkey Mayo, B.S., LL.B., J.S.D., *Dean; Professor of Law*
James Forrester Davison, A.B., LL.B., LL.M., S.J.D., *Professor of Law*
Robert Galloway Dixon, Jr., Ph.D., LL.B., *Professor of Law*
Robert Kramer, A.B., LL.B., *Professor of Law*
Leroy Sorenson Merrifield, A.B., LL.B., M.P.A., S.J.D., *Professor of Law*
Arthur Selwyn Miller, A.B., LL.B., S.J.D., *Professor of Law*
Charles Bernard Nutting, A.B., J.D., LL.M., S.J.D., LL.D., Litt.D., L.H.D., *Professor of Law*
Glen Earl Weston, B.S., LL.B., *Professor of Law*

PROGRAMS OF STUDY

Degrees of Master of Laws and Doctor of Juridical Science

The administration of justice under law is a matter so vast and complex that some graduates feel the need for further study to broaden and deepen their understanding of the law. Others wish to extend their study into rapidly developing specialized fields. Graduate instruction, leading to the degree of Master of Laws enables qualified students to attain one or both of these objectives.

The degree of Doctor of Juridical Science is offered for selected students whose aim is to extend still further their studies by pursuing original research in law.

Graduate work is available to evening as well as day students for the convenience of lawyers in private practice and in government service.

Continuing Legal Education

An important part of the graduate program is the offering of courses in various fields of the law for members of the bar not interested in degree candidacy but desirous of keeping abreast of current developments. The offerings in the field of governmental regulation provide opportunities for specialization. Although third-year and graduate courses are particularly suitable, first-year and second-year courses may be taken in appropriate cases. Members of the bar taking graduate work in this way register as unclassified students or as Continuing Legal Education students.

Programs for Foreign Lawyers

To meet the needs of lawyers from countries whose legal systems are not based on the English law, the Law School provides two additional programs of study. For those who wish to acquire an understanding of our system which will permit them to work with its materials and practitioners after returning to their own countries, the program for the degree of Master of Comparative Law permits a selection of regular courses taken with undergraduate and graduate students. Foreign lawyers who wish to practice in a common law jurisdiction may enroll in the program for the degree of Master of Comparative Law (American Practice), a more intensive program of courses appropriate to this goal.

* The President of the University, the Dean of Faculties, the Assistant Dean for Development in the National Law Center, the Registrar of the University, and the Director of Admissions of the University are members ex officio of the Faculty.

Research in Public Law

Research in public law is conducted under the supervision of members of the Faculty of the Graduate School of Public Law. The purpose of this research is to furnish means for training specialists in public law, either as government lawyers or as lawyers representing individuals or corporations in cases in which the Government is a party; and to assist in the analysis, clarification, formulation, and improvement of public law, substantive and procedural.

Candidates for graduate degrees and specially qualified seniors may pursue this work.

ENTRANCE REQUIREMENTS

Candidates for graduate degrees must be accepted by the Faculty of the Graduate School of Public Law.

*For the Degree of Master of Laws.**—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a minimum average of 75 on all work done for the Bachelor of Laws degree, except that at the discretion of the Faculty applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative. Advanced standing will not be granted for credits earned while a candidate for the first degree in law or for credits earned at another law school. Credits earned as an unclassified student will not be applicable toward meeting the requirements for the degree unless specific provision therefore is included in the letter of admission.

For the Degree of Master of Comparative Law and *Master of Comparative Law (American Practice).*—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycee, or liceo; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

For the Degree of Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university; a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools; and outstanding capacity for scholarly work in the field of law.

Unclassified Students

A member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this School.

Continuing Legal Education Students

A simplified admission and registration procedure is used for members of the bar who desire to take courses on a noncredit basis. Continuing Legal Education students may not participate in student activities or benefit from the medical privileges of the University.

* One-half of the work necessary for graduation from an approved college or university completed prior to entry into military service may be accepted as satisfying the admission requirement for pre-legal work provided the applicant completed not less than twenty months of continuous service in the armed forces of the United States during World War II and prior to the beginning of the 1948–49 fall semester.

REQUIREMENTS FOR THE DEGREES

Master of Laws

To be recommended for the degree of Master of Laws (LL.M.) the student must have completed a residence period of not less than two semesters. Such residence should normally be continuous. All requirements for the degree must be completed in this School and in a period not exceeding two years after registration for work for the degree. The student must have completed, with a minimum average of 75, 20 semester hours in courses listed in the law curriculum as graduate courses except that in appropriate cases second- and third-year courses may be approved for inclusion in the program of study if not previously taken.

Master of Comparative Law

The degree of Master of Comparative Law (M.Comp.L.) is for foreign students who intend to return to their countries. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed satisfactorily 24 semester hours in approved courses in the curriculum of the School or of such other departments of the University as the Faculty of the School shall approve.

Master of Comparative Law (American Practice)

The degree of Master of Comparative Law, American Practice (M.Comp.L.(Am. Prac.)) is for foreign students who intend to remain in this country. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed 28 semester hours in approved courses in the curriculum of the School with a cumulative average of at least 65.

Doctor of Juridical Science

To be recommended for the degree of Doctor of Juridical Science (S.J.D.) the student must have completed a residence period of not less than one academic year. He must have pursued a course of study and research designated by his consultative committee and approved by the Faculty of the Graduate School of Public Law. At the conclusion of his first year of residence, or at such other time as the Faculty may set, the candidate must pass an oral examination in those fields of study selected by the consultative committee. This examination is conducted by the consultative committee and such other members of the Faculty and qualified experts as are selected by the Faculty.

No later than the date specified in the University calendar the candidate must submit to the Dean of the Graduate School of Public Law three complete copies of the dissertation together with a fourth copy of the summary. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. To be acceptable the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information will be supplied by the Dean.

The summaries of accepted dissertations will be printed in a numbered issue of the University Bulletin. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

GENERAL INFORMATION

Entering Classes

The curriculum is organized so that students may enter the Law School at the beginning of the fall or spring semester of the academic year, but not at the beginning of the summer term.

Day and Evening Divisions

Most day classes meet for fifty-minute periods between 9:10 A.M. and 1:00 P.M., Monday through Friday; Trial Practice Court meets for two-hour periods on Saturday morning.

Evening classes meet for two fifty-minute periods from 5:50 to 7:40 P.M., Monday through Friday. A four-credit course, e.g., Torts, meets two evenings a week; a three-credit course, e.g., Administrative Law, meets two evenings a week for one half the semester and one evening for the other half; a two-credit course, e.g., Personal Property, meets one evening a week. The evening division conforms to the standards of the morning division, the full-time faculty participating in the instruction.

Summer Term

A term of two sessions, with day and evening classes, is offered in the summer. Continuing students and transfer students may register for either or both sessions. *No beginning students are admitted to the summer term.*

The summer term is shorter than a semester of the academic year, and, as a consequence, a student must attend two and one-half summer terms to receive residence for one academic year or attend one and one-half summer terms to receive residence for a semester.

A maximum of 6 semester hours may be taken each session by day students. Such students will receive two-fifths of a semester of residence credit upon the completion of 4 or 6 semester hours in one session, and will receive four-fifths of a semester of residence credit upon completion of 8 or more semester hours in two sessions. A maximum of 4 semester hours may be taken each session by evening students. Such students will receive three-tenths of a semester of residence credit upon the completion of 4 semester hours in one session, and will receive six-tenths of a semester of residence credit upon the completion of 6 or 8 semester hours in two sessions.

Summer students planning to take the New York bar examination must register at the beginning of the term for both sessions and must complete both and carry a full program of courses.

The Library

The Law Library of 58,000 volumes contains the official reports of the decisions of the courts of last resort of all states prior to the National Reporter System, and of some states complete to date: the National Reporter System, complete; the reports of the United States Supreme Court and lower federal courts, and the reports of federal administrative agencies; Shepard's Citations for the units of the Reporter System; the English Reports, Full Reprint; the English Law Reports; the Times Law Reports; the Dominion Law Reports; the United States statutes and codes; complete sets of statutes of all the states; the English statutes; the principal English and American digests and encyclopedias; collections of special reports and annotated cases; United

Nations documents; and leading textbooks and treatises. Approximately 335 legal periodicals are currently received. A section of the library, consisting of books acquired from National University, is known as the National University Law Collection.

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card issued upon the payment of fees, must be presented as identification.

Also available to law students are 50,000 bound volumes and 20,000 pamphlets of the former library of the Carnegie Endowment for International Peace, in the fields of international law and relations, history, and economics, in the University Library.

The Law Library, which is on the fourth floor of Stockton Hall, is open from 9:00 A.M. to 10:00 P.M., Monday through Friday; from 9:00 A.M. to 5:00 P.M. on Saturday; and from 2:00 to 6:00 P.M. on Sunday. Books and other materials do not circulate and must be used in the library.

The Law Review

The George Washington Law Review, published by the University, is edited and managed by students of the Law School under the supervision of faculty advisers. It is devoted exclusively to state and federal public law. The location of the University in the National Capital, where the primary sources of federal public law may be observed in operation, affords an unexcelled opportunity for specialization in this field.

The student staff participates in a two-year *Law Review* program. The editorial staff is selected from among those students who have successfully completed the first year of *Review* work. Students receive four hours of academic credit for the two-year program.

Placement Service

The Law School takes a continuing interest in the placement of its graduates in private practice and governmental service, as well as with industry and commerce. The Dean, the Faculty, and the University Placement Office cooperate in collecting information from alumni, law firms, and government agencies concerning opportunities in legal positions throughout the country. Senior law students and recent graduates are urged to keep in touch with the Law School Placement Office.

APPLICATION FOR ADMISSION

Forms for application for admission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FEderal 8-0250, extension 344. The completed form should be returned to the Office of the Director of Admissions, with an application fee of $10 for a degree candidate, $5 for a non-degree candidate. Two recent signed photographs must accompany the application.

Bachelor of Laws Application.—In order to provide sufficient time for the evaluation of credentials, the Law School Admission Test score in addition to the other papers should be received by July 1 for fall semester admission. This means that the November, February, or April Law School Admission Test should be taken. (See "Entrance Requirements for the Degree of Bachelor of Laws," pages 8–9.) In cases of emergency, the Law School Admission Test may be taken in August, but this will delay action upon the application until just before the fall semester. *All papers should be received by the Admissions Office not later than December 1 for the spring semester and not later than May 1 for the summer term.*

Graduate Degrees.—Application for admission as a candidate for a graduate degree and all required credentials should be received by the Admissions Office by July 1 for the fall semester, December 1 for the spring semester, and May 1 for the summer term. An applicant for admission as a candidate for the degree of Doctor of Juridical Science should write to the Dean of the Graduate School of Public Law for special instructions.

Nondegree Study.—Application for admission for nondegree status should be received with necessary credentials at least *one month prior to the first day of registration for the semester or term for which the application is filed.*

The early filing of applications is urged. As a general rule, late applications will be considered only if the application form and all required credentials are received in the Admissions Office not later than two weeks prior to the first day of registration for the semester or term for which the application is filed.

READMISSION

A student who has previously registered in the Law School but who did not attend during the semester prior to registration (summer term excluded) should file an application for readmission at least two weeks in advance of registration. If the student applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of the Director of Admissions from each institution attended before his application will be considered. Applications for readmission are considered on the basis of regulations currently effective.

REGISTRATION

Before attending classes each student must present himself in person for registration. No student will be registered in the Law School or the Graduate School of Public Law until proper credentials have been filed and approved (see "Admission").

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in The George Washington University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration.* Allowance of credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

Registration is held in Stockton Hall, 720 Twentieth Street NW., during the following periods: *fall semester,* September 20 and 21, 12:00 to 8:00 P.M.; September 22, 10:00 A.M. to 1:00 P.M. *Spring semester,* January 31 and February 1, 12:00 to 8:00 P.M., February 2, 10:00 A.M. to 1:00 P.M.

A late-registration fee of $5 is charged each student who is permitted to register after the regular registration days.

Registration may be changed only with the permission of the Dean.

FEES AND FINANCIAL REGULATIONS

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	$10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00

Tuition Fees

Full-time program (more than 10 hours): for each semester	400.00
Part-time program: for each semester hour for which the student registers	30.00
For the degree of Doctor of Juridical Science:	
For work leading to and including the final examinations	1,000.00
Special fee, Law School (Student Bar Association activities, *Law Review*, and other services), charged each student in the Law School for each semester or any part thereof except summer term	10.00
Graduation fee	25.00
Fee for printing summary of doctoral dissertation	85.00
Fee for special examinations, for each subject	5.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one course or more than one course	2.00
Residence fee,* charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements	30.00
Service fee, charged each student for late payment of tuition, see "Payment of Fees"	2.00
Reinstatement fee, charged each student who is reinstated after being suspended for delinquency in fees	5.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under "Health Administration", page 26. These privileges, however, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

Payment of Fees

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

Subject to the approval of the Treasurer, a student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day† in November; one-third on the first working day† in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day† in March; one-third on the first working day† in April.

A student who fails to meet payments when due but who pays his fees on or before the fifteenth of the month in which payment is due is charged a service fee of $2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of $5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

* Payment of the residence fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the requirements which were in force at the time of his first registration but does not count as part of the residence requirement for the degree.

† The University work week is Monday through Friday, inclusive.

Withdrawals and Refunds

Application for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice.

In authorized withdrawals and changes in schedules, financial adjustments will be made as follows:

Fall Semester.—Withdrawal dated on or before the last working day* in October, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in November, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in November.

Spring Semester.—Withdrawal dated on or before the last working day* in February, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in March, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in March.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and the course is dropped before the regular registration day. In this case a withdrawal fee of $5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Withdrawal from a course or from the University between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

The grade of zero will be given in a course dropped without the approval of the Dean.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, LOAN FUNDS

Law School Research Assistantships.—Student research assistantships are available each year to students currently enrolled in the Law School, preference being given to applicants who are completing their second year. Each assistant receives an annual stipend. Awards are made on the basis of academic standing, financial need, and capacity for leadership. Research assistants have duties similar to those of teaching fellows. Applications should be submitted to the Dean of the Law School not later than May 1.

Law Teaching Fellowships.—Teaching fellowships are available each year to prospective candidates for the Master of Laws degree. Each fellow receives an annual stipend, plus tuition for the academic year. Teaching fellows follow an ap-

* The University work week is Monday through Friday, inclusive.

proved program of study and research, assist members of the Faculty in the guidance of first-year students, and supervise student work in legal bibliography and the drafting of legal instruments. Upon satisfactory completion of the year's work, a fellow is recommended for the degree of Master of Laws. Applications should be submitted to the Dean of the Graduate School of Public Law not later than March 15.

Mary Covington Memorial Scholarship.—Established in 1961 by Mary S. English in memory of her aunt, Mary Covington LL.B. 1922. Awarded annually to a deserving second-year student in the evening division of the Law School on the basis of scholastic achievement.

Charles Worthington Dorsey Memorial Scholarship.—This scholarship, established in 1947 as a memorial to Charles Worthington Dorsey, Bachelor of Laws, '81, Master of Laws, '82, is awarded upon the recommendation of the Faculty of the Law School to a needy and promising graduate of Columbian College of Arts and Sciences or other division of the University, with a Bachelor of Arts or other equivalent degree, who has maintained an average of *B* as an undergraduate student and who desires to pursue the study of law as a full-time student. The scholarship covers tuition for the course leading to the degree of Bachelor of Laws, provided that the holder maintains an average of 75. The right is reserved to suspend the benefits of the scholarship for cause at any time. The scholarship is awarded ordinarily once every three years.

Law School Scholarships.—Scholarships are available each year in the Law School to graduates of accredited colleges. Each scholarship provides full three-year tuition in the day division of the Law School. Candidates must have graduated in the upper fifth of their class and must have demonstrated qualities of leadership in addition to scholastic attainment. To retain the scholarship, the successful candidate must maintain a minimum average of 75. Application must be made before March 1 to the Dean of the Law School.

Tuition scholarships are also available to second- and third-year full-time students with averages between 75 and 100. Applications should be made to the Dean of the Law School prior to July 1. The scholarships are awarded after the spring semester grades are reported.

Phi Delta Delta Scholarship.—Zeta Chapter of Phi Delta Delta Legal Fraternity (International) offers annually a scholarship to the woman student in the sophomore class who has excelled in scholastic achievement and service to the Law School in her first year.

Charles Glover Prize.—This prize, established in 1957 by Charles Carroll Glover, Jr., a Trustee of the University, in memory of his great-grandfather, Charles Glover, an illustrious member of the bar of the District of Columbia, consists of selected law books and is awarded annually to the student in the Law School who has attained the highest average grade in the third-year, full-time course.

Kappa Beta Pi Prize.—Eta Alumnae Chapter of Kappa Beta Pi Legal Sorority offers an annual prize which consists of a copy of Blackstone's *Commentaries* or a legal dictionary. Awarded to the woman law student who attained the highest average in her first year.

John Bell Larner Prize.—This prize, established by the bequest of John Bell Larner, consists of a medal which is awarded annually to that member of the graduating class in the Law School who attains the highest average grade in the entire course for the degree of Bachelor of Laws or Juris Doctor.

John Ordronaux Prizes.—Established in 1909 by the bequest of John Ordronaux. Prizes are awarded annually to the student in the Law School who has attained the

highest average grade in the first-year, full-time course and to the student who has attained the highest average grade in the second-year, full-time course.

Through the generosity of friends of the University a number of loan funds are available to students in the Law School. Application for loans should be made to the Treasurer of the University.

REGULATIONS

Amount of Work

Students without substantial outside employment may take a program of studies of 14 hours a week. Such students may take courses in the evening only if they are not available in the daytime and if a majority of the hours taken are in day courses. Students with 20 hours or more of outside employment whether in the day or evening division, must take a limited program of studies not exceeding 10 hours a week. Students taking a majority of their classes in the evening may not take more than 10 hours a week; the minimum load is 8 hours, except in special cases where 6 may be approved for a limited time. A minimum schedule of 10 hours in the day division is required except in exceptional circumstances when a reduced program is authorized by the Dean for continuing students.

Attendance

Regular attendance at classes is required and is necessary for successful work. A student who is deficient in class attendance in any course may be barred from taking the examination, and the course must be repeated.

Changes in Program of Studies

A student may not drop or add courses or change from one section to another of the same course without the approval of the Dean.

Summer School Credit

Students planning to attend summer school sessions at other law schools and desiring to use credits obtained at such schools in their course at this Law School must first have the courses they wish to take approved by the Dean. In no event will credits be recognized in excess of those which might be obtained in a similar period in this School.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first transcript; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

Graduation Requirements

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Degree Requirements.—The student must meet the curriculum, scholarship, and residence requirements of the degree for which he is registered.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return, unless during his absence he maintains "in residence" status by paying the residence fee, see page 18.

A student who has completed tuition requirements, but whose graduation is deferred for any reason must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Presence at Graduation.—Presence at the graduation exercises is required of the candidate, unless the work for the degree was completed during the summer term or written application for graduation *in absentia* has been approved by the Dean.

Examinations

Written examinations are held at the end of each course. Every student is required to take the regular examinations unless excused. No excuse for absence will be granted except by the Dean and then only for illness or other emergency. Application for excuse must be made in writing not later than one month after the date of the examination. An entry of *I*, incomplete, will be made on the record of a student thus excused. To receive credit for the course, he must take the next regularly scheduled examination. The examination may not be taken after exclusion for low scholarship.

Permission to take an examination before the regularly scheduled date will not be granted. Permission to take a postponed examination is limited to the situation provided for in the preceding paragraph.

A special examination will be granted only to a student entitled to take a postponed examination, who is a candidate for a degree to be conferred at a convocation which precedes the next regular examination in the subject. Written application, showing sufficient cause, should be addressed to the Dean, and approval will be granted at the discretion of the Faculty.

If a student fails to take an examination, a grade of zero will be recorded unless he has been excused from the examination as provided above or has obtained the Dean's permission to drop the course.

Grades

Grades are given in numerical terms which are equivalent to letter grades according to the following scale: 85–100, *A*, excellent; 75–84, *B*, good; 65–74, *C*, satisfactory; 55–64, *D*, poor—below standard for graduation; below 55, *F*, failure. A student who has been excused from failure to take a regularly scheduled examination is given the grade of *I*, incomplete, and a student who has been barred from taking an examination because of excessive absences is given the grade of *EA*. See "Examinations" above, for grade upon failure to take an examination. Grades between 65 and 100 indicate that the work has been completed and credit given for the courses. Grades between 55 and 64, however, do not represent satisfactory work and adversely affect a student's cumulative average. No credit is given for grades below 55.

A student may not repeat a course he has failed, except by permission of the Faculty.

The cumulative average of a student includes all grades in all courses taken while he is a candidate for a particular degree. When a course is repeated, both the first grade and the subsequent grade or grades are counted in the cumulative average.

Exclusion and Probation for Poor Scholarship

Candidates for the Degrees of Bachelor of Laws and Juris Doctor.—A student will be excluded who fails in courses aggregating 8 or more semester hours in one semester or in two successive semesters, or who fails in courses aggregating 10 or more semester hours during his period of law study. A student subject to exclusion under this provision who is currently registered will be permitted to complete the work of the semester.

A student not subject to exclusion under the foregoing rule who at any time fails to maintain a cumulative average of at least 65 will be placed on probation. A student on probation may at the discretion of the Dean be required to reduce his program of study. If a student on probation does not, by the end of the second semester following that in which his average has fallen below 65, receive grades sufficient to give him a cumulative average of at least 65, he will be excluded. If a student on probation attains a cumulative average of at least 65 by the grades received during the semester his status will then become clear. A maximum of three semesters of probation is allowed. Thus, if a student whose status has become clear after two semesters of probation subsequently goes on probation, he will be allowed only one semester of probation in which to raise his average to at least 65.

In special cases in which a student who has been excluded can clearly demonstrate that his low grades were due to special circumstances beyond his control and that he has the capacity to pursue the study of law with a definite likelihood of success, such student may be readmitted by the Faculty subject to such conditions as the Faculty may impose.

Candidates for Graduate Degrees.—A candidate for one of the graduate degrees whose work is not satisfactory in the opinion of the Faculty, taking into consideration the requirements and standards for the degree, may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Unclassified Students.—An unclassified student whose work is not satisfactory in the opinion of the Faculty may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Academic Dishonesty

Evidence of dishonesty on the part of any student will result in his suspension by the Dean upon recommendation of the Dean's Council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for all courses in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in computation of the cumulative average.

If the student suspended for academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the cumulative average.

Classification of Students

Candidates for the degree of Bachelor of Laws are divided into classes on the completion of semester hours as follows: (1) full-time students: first year, 1–28; second year, 29–56; third year, 57 or more; (2) part-time students: first year, 1–20; second year, 21–40; third year, 41–60; fourth year, 61 or more.

Right to Change Rules

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

Right to Dismiss Students

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration.

The right is reserved by the University to dismiss or exclude any student from the University or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

Property Responsibility

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

STUDENT ACTIVITIES AND SERVICES

The Student Bar Association

Every student in the Law School is a member of the Student Bar Association, which is organized to enable students to become better acquainted with problems of the profession, to foster professional ideals, and to bring about closer contact with members of the profession engaged in active practice of the law. The work of the Student Bar Association is carried on by various committees and by group and general meetings of a professional and social nature. From time to time lectures are given by outstanding authorities on legal and professional problems.

An important activity is the Van Vleck Case Club Competition, which provides an opportunity for training in appellate advocacy. First and second year students participate as contestants before courts composed of members of the Faculty and the local bar. Senior law students of the Case Club also sit as judges. The final argument is held before a court composed of distinguished federal judges.

The Legal Aid Program is under the joint sponsorship of The George Washington University Student Bar Association and the Junior Bar Section of the District of Columbia Bar Association. Participating students assist court-appointed attorneys in the preparation of cases for trial or appeal. Qualified second- and third-year students are eligible for participation in the program.

In the ranking of member associations by the American Law Student Association, The George Washington University Student Bar Association has received first place twice and second place twice in the past six years.

Order of the Coif

The Order of the Coif, a national honor society with chapters in over forty law schools, aims "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." The George Washington University Chapter was established in 1926. Members are elected each year from the highest-ranking 10 per cent of the graduating class of the Law School.

Living Accommodations

The University maintains five residence halls. Meals are served at the Student Union.

Admission to the University does not include room reservation. A separate application for a room should be made well in advance (for the fall semester by May 1, for the spring semester by January 1). Forms for application, together with detailed information; may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

Girls under the age of twenty-one who are enrolled for twelve or more semester hours of academic work in the University and who are not living with their parents or relatives may live outside the residence halls only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. Permission is not granted for such girls to live outside the residence halls except with persons approved by the Director of Activities for Women.

Women Students.—Hattie M. Strong Hall provides single rooms at $47.50 a month and double rooms at $40 a month a person.

Dolly Madison Hall provides double rooms at $40 a month a person.

Men Students.—Welling Hall provides double rooms at $30 a month a person.

John Quincy Adams Hall provides double rooms, each with student alcove and bath. Rooms rent at $40 a month a person.

John C. Calhoun Hall provides double rooms at $40 a month a person.

Residence hall payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of $2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of $5.

Student Employment

The Law School takes a continuing interst in the placement of its students and maintains a limited placement service for that purpose. In addition, the University Placement Office, 2114 G Street NW., provides assistance to students seeking full- and part-time employment. This office maintains a registry of positions locally and nationally available and refers qualified applicants for consideration. Information is also available on Civil Service examinations.

A day student taking the regular program (more than ten hours) must limit out-

side employment to less than twenty hours. (See "Amount of Work" page 21.) It is urged that day students refrain from engaging in outside employment during their first semester or first year in Law School. Although work in some special areas may contribute to the learning and experience of the student, as a general rule it will compete with time needed for adequate study and preparation, which are at the heart of a good legal education. The evening program is planned to provide a desirable reconciliation of these competing considerations but results in a more demanding schedule for the student.

Health Administration

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school; (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.* All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week), is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of physical education.

* See Rule (5) for exception.

COURSES OF INSTRUCTION

IN THE LAW SCHOOL AND THE GRADUATE SCHOOL OF PUBLIC LAW

The courses of instruction listed below are subject to change. The University reserves the right to withdraw any course announced.

First-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses, from 401 to 500.

The number of hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving two hours of credit each semester is marked (2–2), and a semester course giving two hours of credit is marked (2).

Day classes begin at 9:10 A.M. Evening classes begin at 5:50 P.M.

Specially qualified third-year students may secure approval to take graduate courses and research in public law.

In appropriate cases Master of Laws candidates may take second- and third-year courses not previously taken.

First Year

110 *Constitutional Law* (4) — Mayo, Dixon, Miller

Spring—day and evening. Basic principles of American constitutionalism; judicial function in constitutional cases; implementation of doctrines of separation of powers, federalism, limited government; development and exercise of national powers; introduction to civil rights and liberties.

115–16 *Contracts I-II* (4–2) — Mayo, Miller, Freedman, Temple

Academic year—day and evening; summer 1962. Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, and remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, and problems of proof; the function of consideration; conditions; assignments; third-party beneficiaries; the effect of changed circumstances; and protection of the client's interests upon breach or threat of breach by the other party. Emphasis on problems of analysis, draftsmanship, and adversary method.

125 *Criminal Law and Procedure* (4) — Cooper, Sharpe, Green

Spring—day and evening. Origin and purposes of criminal law; elements of criminal liability; mental disorders; solicitation, attempt, and conspiracy; crimes against the person, against property, and against both; statutory offenses; criminal procedure, with consideration of Federal Rules of Criminal Procedure.

135 *Legal Method and Legal System* (4) — Fryer, Benson, Sharpe, Goldsborough

Fall—day and evening; spring—day and evening. Introduction to substantive and procedural law dealing with basic concepts; training in method and technique of case law and legislation using modern case records; practice in use of law books and in legal writing; importance of language in law; legal reasoning and use of precedents under doctrines of stare decisis, law of the case, and res judicata; development of Anglo-American legal system; organization of judiciary and bar, stressing enforcement of ethical standards.

145 *Personal Property* (2) — Fryer, McAvoy, Sullivan, Green

Fall—day and evening; spring—day and evening. Concepts of property, including interests created by bailments, liens, and pledges; methods of acquiring ownership.

150 *Real Property* (4) — Benson, Walburn, Sullivan, Baker

Fall—day and evening; spring—day; summer 1962. Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and

tenant relationship; concurrent estates; future interests at common law and after the Statute of Uses; the Rule Against Perpetuities; incidents of divided ownership, as waste; natural rights.

160 *Torts* (4) — Merrifield, Walburn, Temple, Seidelson

Fall—day; spring—day and evening. Liability for harm to others: intentional misconduct; the law of negligence, including consideration of fault and appropriate distribution to risk-costs as bases of liability; comparison of liability for physical harm with liability for mental and economic harm.

SECOND YEAR

201 *Agency* (2) — Cooper, Freedman

Fall—day and evening; summer 1962. Master and servant (status of agent), respondeat superior, nature of agency relation, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification.

202 *Administrative Law* (3) — Davison

Fall—evening; spring—day; summer 1962 (as a four-credit course). The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies.

205 *Appellate Practice and Procedure* (2) — Freedman

Spring—day and evening. Appellate practice and procedure will be studied through texts; consultation with appellate judges and law clerks and with attorneys who have cases pending on appeal; observation of arguments in the United States Supreme Court and the Court of Appeals for the District of Columbia Circuit; and analysis of records, briefs, and oral arguments in actual and in moot cases. Each student will brief and argue one advanced-level moot case and will prepare one moot court record for use in first-year Case Club. Students taking this course will take only two hours of Trial Practice Court. Admission by permission of the instructor.

210 *Business Associations* (4) — McAvoy, Seidelson, Kirkpatrick

Fall—day and evening; summer 1962. Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share structure; problems of operation; relations between partners; roles of shareholders, directors, officers; control devices; distributions to owners; voluntary reorganization; dissolution and termination.

215 *Civil Procedure* (4) — Walburn, Temple, Green

Fall—day and evening; summer 1962. The mechanics of litigation—the rules which govern the process by which the rights and duties studied in substantive law courses are enforced: pleadings, discovery, pre- and post-trial motions, jurisdiction and venue, equity jurisdiction and trial by jury, former adjudication. Emphasis is on the Federal Rules of Civil Procedure but the principles and main problems indigenous to all procedural systems are developed.

219 *Commercial and Investment Paper* (3) — Ledakis

Fall—day and evening; summer 1962 (as a four-credit course). Bills of exchange, promissory notes, checks, bonds, certificates of stock, and other forms of commercial and investment paper in the context of their business function and legal setting under the common law and uniform laws, including the proposed Uniform Commercial Code.

224 *Sales and Sales Financing* (3) — Ledakis

Spring—day and evening. The law relating to the sale and distribution of goods and to the security financing devices utilized in this connection, with particular attention to the effect of existing and proposed uniform laws.

230 *Conveyances* (2) — Baker

Fall—day and evening; spring—evening; summer 1962. Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and adverse user; zoning and other land controls.

235 *Domestic Relations* (2) — Potts, Seidelson

Fall—day and evening; spring—evening; summer 1962. Marriage, annulment, and divorce; adoption and custody of children; economic relations.

238 *Equity* (2) — Sullivan

Spring—day and evening; summer 1962. A correlation of aspects of equity considered in earlier courses, and inquiring into the nature of equity jurisprudence through analysis of selected problems in equity: historical development of equity, including problems of merger of law and equity; use of equity jurisdiction offensively and defensively, including multi-party actions, injunction of executive and legal actions, and equitable abstention; emphasis on the fashioning of equitable remedies.

240 *Evidence* (4) — Fryer

Spring—day and evening; summer 1962. Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule.

243 *Federal Jurisdiction* (2) — Cooper, Kirkpatrick

Fall—day and evening. Constitutional and statutory origins of federal courts, cases arising under the laws and the Constitution, diversity of citizenship, jurisdictional amount, removal procedure and jurisdiction, limitations on federal jurisdiction, state and federal conflicts, substantive law applied by federal courts.

251 *Insurance* (2) — Temple

Fall—day; summer 1962. A primary risk distributing medium and the rules by which legislative, administrative, and judicial bodies seek to promote its benefits and avert its dangers. Includes insurance marketing, insurable interest, subrogation, transfer of insurance benefits to nonpolicyholders, coverage and other insurance policy provisions, disposition of claims.

254 *International Law and World Order* (3) — Mallison

Fall—day and evening. Traditional content of course in international law presented in context of values and institutions of the world community; formal prescription and effective practice concerning participants in decision-making processes; roles of individuals, international public organizations, political parties, pressure groups, private associations, and national states.

259 *Labor Law* (3) — Merrifield

Spring—day and evening. Law governing labor-management relations, organization and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intraunion relations.

265 *Law and Accounting* (2) — S. Cohen

Fall—day; spring—evening. Study of fundamental accounting principles with emphasis on corporation accounting; legal and accounting implications of specific items on financial statements of corporations; inventory adjustments; corporate transactions, distributions, and capital adjustments.

270 *Legislation* (2) — Nutting, Mallison

Fall—evening; spring—day; summer 1962. The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation.

274 *Taxation—Federal Estate and Gift* (2) — Kramer, Hambrick

Fall—day and evening. A survey of the substantive provisions of the federal estate and gift tax laws, including inter vivos transfers, transfers in contemplation of death, joint interests, life insurance proceeds, property subject to powers of appointment, the marital deduction and split gifts; tax procedure.

279 *Taxation—Federal Income* (3) — Hambrick, Weaver

Fall—evening; spring—day; summer 1962 (as a four-credit course). Survey of substantive provisions of federal income tax, including concept of gross income, limitations on allowable deductions, problems of capital gains taxation, nontaxable exchanges

of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting.

285–86 *Trusts and Estates I-II* (2–4) Weaver, McAvoy

Academic year—day and evening. An integrated view of considerations (other than tax) in noncommercial transfers of wealth at death or during life with emphasis on the drafting of documents best suited to achieve the wishes of the property owner and meet the needs of his family. *First half:* distribution and administration of intestate estates; formal requirements for execution of wills and trusts; revocation and alteration; grounds for contest; limits on testamentary freedom. *Second half:* dispositive provisions in wills and trusts; common problems of construction; future interests questions including class gifts, powers of appointment, and limits imposed by Rule Against Perpetuities, etc.; problems of administration of estates and trusts including allocations to principal or income, investments, powers to manage, sell, etc.; charitable trusts. Supervised practice in drafting is included. Prerequisite to Law 286; Law 285.

295 *Unfair Trade Practices* (3) Weston

Fall—day and evening; summer 1962 (as a four-credit course). Unfair trade practices at common law and under statutes; trade-marks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Federal Trade Commission Act; resale price maintenance under state Fair Trade Acts; state sales-below-cost statutes; Robinson-Patman Price Discrimination Act; miscellaneous business practices.

THIRD YEAR

302 *Admiralty* (2) Sharpe

Fall—evening. Sources and characteristics of the maritime law of the United States, jurisdiction of federal and state courts, personal injury and death questions peculiar to seamen and maritime workers, collision, limitation of liability.

307 *Comparative Law* (3) Davison

Spring—evening. The Civil Law System; general introduction to foreign law as exemplified by Roman Law and the French and German Civil Codes; comparative study of administration of justice and legal institutions. This course deals with delictual and contractual obligations.

309 *Conflict of Laws* (3) Dixon, Seidelson

Fall—day and evening; summer 1962 (as a four-credit course). Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations.

311 *Copyright Law* (2) Weston, Cary

Spring—evening. Historical background; formalities and essentials in securing a copyright; subject matter of copyright; remedies; international aspects of copyright under Berne Union, Universal Copyright Convention, and Inter-American Convention; copyright licensing and performing right societies.

313 *Constitutional Interpretations* (2) Dixon

Not offered 1962–63. Advanced course in constitutional law. The Constitution and constitutional tradition, process of judicial decision-making, significance of "due process", current constitutional developments, adequacy of the traditional system of powers and limitations, introduction to comparative constitutional law.

318 *Creditors' Rights* (3) Kirkpatrick

Spring—day and evening; summer 1962 (as a four-credit course). Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration.

321–22 *Current Decisions* (2–2) Seidelson, Sullivan

Academic year—day and evening. Required of, and limited to, members of the student staff of the *Law Reveiw.*

330 *Federal Antitrust Laws* (3) Weston, Kirkpatrick
Spring—day and evening. Restraints of trade at common law and under Sherman Antitrust Act of 1890, Federal Trade Commission and Clayton Acts by mergers, monopolies, price-fixing agreements, trade associations, exclusive-dealing agreements, tie-in sales, and trade boycotts; patents and copyrights under antitrust laws.

335 *Jurisprudence* (2) Mayo, Kramer
Fall—evening; spring—day. History of jurisprudence; schools of jurists, particularly the nineteenth century schools; sociological jurisprudence; theories of justice; the nature of law; law and morals; law and the state; the scope and subject matter of law; sources and forms of law; the traditional element; analysis of general legal concepts.

339 *Collective Bargaining and Labor Arbitration* (2) Merrifield
Fall—evening. The collective labor agreement: its content, negotiation, and administration through the grievance procedure and arbitration; problems in the settlement of labor disputes.

341 *Labor Standards and Social Security Legislation* (2) Merrifield
Not offered 1962–63. Legal problems arising under federal and state statutes dealing with labor standards and social security. Particular emphasis is placed upon the regulation of wages and hours, workmen's compensation, and insurance against unemployment and old age.

345 *Legislative Drafting* (2) Zinn
Fall—evening. Advanced instruction and practice in legislative drafting.

349 *Local Government Law* (2) Mallison
Spring—evening; summer 1962. The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development.

355 *Mortgages* (2) Baker
Summer 1962. Security interests in real property, their creation, transfer, enforcement and extinguishment.

359 *Patent Law** (2) Robillard
Fall—evening. Origin and nature of patents, patentable subject matter, classes of patents, novelty, utility, invention, patent claims and their interpretation, acts constituting infringement, correction of patents.

360 *Advanced Topics in Patent Law* (2) Harris
Spring—evening. Lectures and discussion; licensing and protection of industrial property; uses and abuses of patents; governmental regulation; protection abroad; the role of patents in business; economic and social functions of patents, trade-marks, and copyrights. Prerequisite: Law 359.

362 *Patent Office Practice** (2) Rose
Spring—evening. Rules and practice; appeal and interference procedure.

365–66 *Patent Trial Practice Court** (2–2) Brown, Rimel
Academic year—evening. Practice before the United States Court of Customs and Patent Appeals and the federal courts. Prerequisite: forty-two semester hours, including Law 215 and 240. Law 359, which is also required, may be taken concurrently. *Patent Trial Practice Court* may be elected instead of Law 385–86 to satisfy the Trial Practice Court requirement. If *Patent Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.

370 *Public Utilities* (2) Fryer, Davison
Spring—evening. Regulation by federal, state, and municipal authorities concerned with licensing, rates, services, and practices, with emphasis on federal regulation of interstate operations; judicial review.

* Patent law students may take Law 359 and Law 365 concurrently in the fall semester and Law 362 and Law 366 concurrently in the spring semester.

376 *Restitution* (2) Sharpe
Spring—day and evening; summer 1962. Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment.

378 *Security Transactions* (3) _____
Spring—day and evening. Suretyship and mortgages: security interests in real and personal property, their creation, transfer, enforcement, and extinguishment; the law of suretyship, especially in the context of accommodation credit and commercial and financial practices.

380 *Suretyship* (2) _____
Summer 1962. The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and non-consensual suretyship relations and the place of suretyship principles in the solution of legal problems generally.

385–86 *Trial Practice Court* (2–2) Jackson, Edgerton, Herrick, Monk, Walsh, Beard, Hart, Kendrick, Skinker
Academic year—day and evening. Trial of assigned cases; trial tactics and techniques; pre-trial and court room procedures pursuant to Federal Rules.
To be taken in the senior year. Prerequisite: forty-two semester hours, including Law 215 and 240. If *Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.

391 *United Nations Constitutional Law* (2) Mallison
Spring—evening. Structure and process of decision of the United Nations—the peaceful settlement of disputes, collective security, regulation of armaments, regional arrangements, and types of functional cooperation.

Graduate Courses

401 *Administrative Law Seminar* (2) Davison
Spring—evening. Group study of specific problems in administrative law.

408 *Constitutional Law Seminar* (2) Nutting, Dixon
Spring—day. Group study of contemporary problems in constitutional law.

412 *Control and Use of Atomic Energy* (2) Green
Spring—evening. Various legal problems involved in the control and use of atomic energy will be examined, including the Atomic Energy Act, the policy underlying the present government monopoly, the security problem of safeguarding atomic military information, the implications in prospective industrial control and use, and legal means of protecting personal interests against the possible consequences of atomic warfare.

415 *Administration of Criminal Justice* (2) Nutting
Spring—evening. Selected problems in the field such as arrest, police interrogation, electronic interception, discovery, and the relative positions of prosecution and defense in preparing cases. The professional responsibility of lawyers will be emphasized.

420 *Estate Planning Seminar* (2) Weaver
Spring—evening. Group study of the effective disposition of wealth, inter vivos and testamentary gifts, conservation for owner's future use, use of insurance, tax and administrative problems, business interests, pension and profit-sharing arrangements.

424 *Evidence and Trials Seminar* (2) Fryer
Fall—evening. Study of selected problems involving presentation of documentary proof and expert testimony in connection with the reforms sought by the Uniform Rules of Evidence and recent developments in the field of forensic medicine.

426 *Forensic Medicine* (2) Head, Sharpe
Fall—evening. Introduction to problems created by the relationships between medicine and the law: a survey of the medical professions; medical education, specialties, ethics, and professional organizations; an outline of hospital organization and facilities; selected studies in the analysis and presentation of medical aspects of legal contro-

versies, as in personal injury litigation, workmen's compensation claims, and disputes over mental capacity, both civil and criminal; the lawyer's role in domestic and international governmental activities in medicine and public health.

428 *Food and Drug Law* (2) Goodrich
Spring—evening. A lecture and discussion course dealing with the Federal Food, Drug, and Cosmetic Act and governmental controls thereunder. Both government and industry viewpoints are considered.

431 *Government Contracts I* (2) McIntire
Fall—evening. A consideration of the basic power of the Federal Government to enter into contracts; the nature and construction of such contracts; normal and war or defense powers aspects of government procurement, including administrative and legislative policy and procedures; forms of contracts; standard clauses; advertised bid procedure problems; negotiated contracts; modification of contracts; remedies on contractual claims.

432 *Government Contracts II* (2) McIntire
Spring—evening. Special problems in government contracts, including adjustments and relief; procedure for prosecuting claims under government contracts; attempts at price, cost, or profit control; termination. Prerequisite: Law 431.

436 *International Regional Organizations Seminar* (2) Miller
Fall—evening. Legal and policy questions involved in American participation in multinational organizations, including General Agreement on Tariff and Trade, Organization for Economic Cooperation and Development, North Atlantic Treaty Organization, and Organization of American States. Concepts of sovereignty and nationalism will be studied. Special attention will be accorded the nascent "Atlantic Community."

442 *Labor Law Seminar* (2) Merrifield
Fall—evening. Group study of contemporary problems in labor law.

449 *Law of the Near East* (2) Liebesny
Not offered 1962–63. A study of the law of the Arab countries, including the basic principles of the Islamic law, an analysis of the present day codes, and an investigation of the Western influences on the laws of the Arab countries.

455 *Legal Problems in Modern Methods of Warfare* (2) Mallison
Fall—evening. The contemporary international law of war; legal aspects of modern methods of coercion (economic, political, psychological, and military); regulation of hostilities; the special problems of atomic, bacteriological, and chemical weapons; war crimes.

463 *Regulation of Communication Media* (2) Mayo
Fall—evening. An examination of the legal doctrine relating to regulatory practices in the channels of mass communication, i.e., newspapers, motion pictures, and radio-television; analysis of the operational structure of the mass media and the pattern of control exercised by government, private associations, and various community groups; appraisal of the comparative utility of various regulatory techniques for implementing policies affecting these media; special emphasis will be placed on the functions of the Federal Communications Commission.

466 *Regulation of Securities and Securities Markets* (2) M. Cohen
Fall—evening. A study of state and federal laws governing the offering and distribution of securities to the public by corporate issuers and others, the regulation of securities markets, and the rights and liabilities of purchasers under such statutes. Particular emphasis will be given to statutes administered by the Securities and Exchange Commission.

469 *Research in Patent, Trade-Mark, and Copyright Law* (2) Harris
Fall—as arranged; spring—as arranged. Registration limited to students with at least a *B* average who have taken Patent Law I and II and related courses including, as a rule, Trade Regulation Seminar. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day.

Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

471 *Research in Public Law* (2) — The Staff

Fall—as arranged; spring—as arranged. Registration limited to students with at least a *B* average who have had a seminar or comparable course in field of proposed research. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

475 *Taxation—Corporate* (2) — Hambrick

Fall—evening. Analytical study of income tax problems in corporate dividends and distributions in redemption of stock; corporate liquidations; reorganizations, mergers, and acquisitions; recapitalizations; organization and sales of corporate businesses; collapsible corporations; carryovers. Prerequisite: Law 279.

480 *Taxation—Oil and Gas* (2) — Hambrick

Spring—evening. A study of the application of the Federal income tax to the producing segment of the oil and gas industry; common types of interests in producing properties; tax treatment of exploration expenditures; intensive study of problems in the deduction of intangible development and drilling costs; the concept of "economic interest"—who is entitled to depletion?; tax distinctions between leasing transactions, sharing transactions, and sales of oil and gas properties and prospects; "ABC" transactions; organizational problems in oil and gas ventures—joint operating agreements, general and liquid partnerships, associations taxable as corporations and pooling arrangements; "carried interests" and other financial arrangements in development of oil and gas properties. Prerequisite: Law 279.

485 *Taxation Seminar* (2) — Hambrick

Spring—evening. Selected problems in federal income, estate and gift taxation, involving factual analysis and legal research, and the preparation of memoranda of law, legislative drafting or other appropriate disposition. Identical problems or cases will be assigned to small groups for development and disposition. Registration subject to approval of teacher. Prerequisite: Law 274 and 279.

490 *Income Taxation of Foreign Business and Investment* (2) — Hambrick

Fall—evening. The provisions and policies of the Federal Income Tax law applicable to foreign income, including considerations affecting the choice of methods of engaging in foreign business and investment, allocation of income in foreign commerce, credit for foreign taxes, principles and trends of U. S. tax treaties, including "tax sparing." The emphasis of the course is on analytical treatment of existing law and present and proposed tax policy with respect to foreign business and investment.

492 *Trade Regulation Seminar* (2) — Weston

Spring—evening. Group study of current problems relating to unfair trade practices and federal antitrust laws.

495 *Urban Redevelopment* (2) — Baker

Spring—evening. Selected problems in urban redevelopment and housing, with particular emphasis on programs under current federal and state legislation.

DEGREES CONFERRED

Bachelor of Laws

February 22, 1961

William Curtis Alford, Jr. — Md.
B.S. 1956, M.B.A. 1957, American University

Frank David AuBuchon — Va.
B.S. in M.E. 1957, University of Missouri

Ernest Sigmund Auerbach — Md.
A.B. in Govt. 1958, The George Washington University

Arthur Francis Bronczyk — Va.
A.B. 1954, Maryknoll College

Thomas Yellott Canby, Jr. — Md.
A.B. 1952, University of Virginia

Anna Joyce Capps — D.C.
A.B. 1957, The George Washington University

Loren Merle Carlson — S.D.
A.B. 1948, Yankton College
A.M. 1952, University of Wisconsin

Lincoln Drury Cathers — Md.
B.S. 1956, Webb Institute of Naval Architecture

Peter Aull Cerick — Va.
A.B. in Govt. 1953, The George Washington University

Walter Theodore Charton — Md.
B.S. 1952, University of Maryand

Kurt Rickey Conner — N.C.
A.B. 1958, Guilford College

John Alexander Dahlstrom — Utah
B.S. 1956, University of Utah

Roland Meade Dameron, Jr. — Va.
B.S. in E.E. 1957, Virginia Polytechnic Institute

Frank Leslie Deierhoi — Va.
A.B. 1949, College of William and Mary

James Edward Denny — Md.
B.E. 1955, Johns Hopkins University

Dan Donato, Jr. — Va.
B.S. 1950, College of Charleston

Frank Louis Fetta — Va.
A.B. 1954, Providence College

Edward James Freeman — N.Y.
A.B. 1951, Johns Hopkins University

Charles Freeman Geschickter, Jr. — Va.
A.B. 1955, Wesleyan University

Ronald Sanford Goldberg — Md.
B.S. 1955, University of Maryland

David Franklyn Grant — Md.
B.S. 1950, University of Vermont

John Robert Grinnell — Va.
B.S. in P.E. 1950, A.M. in Ed. 1951, The George Washington University

Robert Michael Guttman — D.C.
A.B. 1952, Harvard University

Blair Parks Hall — Md.
A.B. 1952, University of Maryland

Neal Hambleton — Md.
A.B. 1956, University of Delaware

Walter Henderson — Md.
B.S. 1953, U.S. Military Academy

Frank Clarence Hilberg, Jr. — Va.
A.B. 1956, University of Virginia

Howard Hosmer, Jr. — D.C.
A.B. 1954, Pennsylvania State University

Donald Dyer Jeffery — Va.
B.S. 1957, University of Wisconsin

Peter Jeffrey — Va.
B.S. in B.A. 1955, Ohio State University

Fred Aivars Keire — Wash.
B.S. in Chem.E. 1957, University of Washington

Adrian John LaRue — Va.
B.S. 1956, Virginia Polytechnic Institute

Julian Paul Lawson — Md.
A.B. 1954, University of Maryland

Charles Richard Lepchinsky — Va.
B.E.E. 1957, The George Washington University

Herbert Levine — D.C.
B.S. 1948, Brooklyn College

Jean Mansur — Va.
B.S. 1946, University of Kansas

Lawrence Stanley Margolis — Md.
B.S. in M.E. 1957, Drexel Institute of Technology

Patricia Louise McDermott — Idaho
A.B. 1958, Idaho State College

Mary Alice McEniry — Va.
B.S. 1942, University of Alabama

Robert Jay Miller — D.C.
B.S. in C.E. 1957, Pennsylvania State University

Sheridan Lew Neimark — Va.
B.S. in Chem.E. 1957, Carnegie Institute of Technology

Dexter Stetson Odin — Va.
B.S. 1956, University of Florida

Jack Ewart Phillips — N.C.
A.B. 1955, University of North Carolina

John Dwight Poffenberger — Va.
B.I.E. 1957, Ohio State University

Raymond Hugo Quist — Va.
B.S. 1957, Newark College of Engineering

Sheldon Foster Raizes — Va.
B.S. in C.E. 1957, University of New Mexico

Gerald Stuart Rosen — Md.
B.S. 1950, Michigan State University of Agriculture and Applied Science

Thomas Jefferson Rothrock — Va.
B.S. 1955, University of Maryland

Robert Morton Sandler — D.C.
A.B. 1958, The George Washington University

Arvid Andrew Sather — Wis.
A.B. 1954, University of Minnesota

Dean Schron — Va.
B.E.E. 1956, Rensselaer Polytechnic Institute

Leland Ancel Sebastian — Ark.
B.S. 1952, Arkansas State Teachers College

Kenneth Fred Sippel — Va.
A.B. 1950, University of California

Thomas Frank Smegal, Jr. — Va.
B.S. in Chem.E. 1957, Michigan College of Mining and Technology

James Enlo Smith — S.D.
B.S. 1952, South Dakota School of Mines and Technology

Dennis Truman Snyder — Md.
A.B. 1957, University of Maryland

Charles Alan Stein — Md.
B.S. 1954, Duke University
B.Chem.E. 1956, University of Florida

Thomas Locis Tarolli — Va.
B.S. in I.E. 1957, University of Pittsburgh

David Thomas Terry — Va.
B.S. in Chem.E. 1956, Purdue University

John Charles Tolford — D.C.
A.B. 1954, University of Michigan

Wayne Day White — Va.
A.B. 1953, Brigham Young University

Harold Anthony Williamson — Va.
B.S. in M.E. 1957, University of Wisconsin

Leonard Alfred Willson, Jr. — N.C.
B.M.E. 1957, North Carolina State College

June 7, 1961

Donald Ralph Antonelli — Va.
B.S. in E.E. 1957, Purdue University

Richard Volker Armstrong — Okla.
A.B. 1958, University of Oklahoma

Robert Freeman Asleson — Minn.
B.S., B.B.A. 1958, University of Minnesota

David Sheldon Band — D.C.
B.S. 1958, University of Maryland

Ira Philip Barsky — Va.
B.S. 1959, New York University
Harry Clark Bell, Jr. — N.Y.
B.S. 1957, Georgetown University
Margaret Anne Beller — Md.
A.B. 1955, A.M. 1957, The George Washington University
Albert Chick Blanchard — Maine
A.B. 1958, Yale University
William Sherwin Broadhead — Idaho
A.B. 1956, Idaho State College
Richard Sutton Buck IV — Va.
A.B. 1958, University of Maryland
John Francis Carney — Va.
B.S. 1957, Northeastern University
Alan William Cheever — Va.
B.S. 1958, New England College
Barry Loomis Clark — Ill.
B.S. in M.E. 1956, Northwestern Technological Institute
Paul Maxwell Coble — D.C.
B.S. 1957, M.S. 1958, Massachusetts Institute of Technology
Austin Brundage Comstock — Md.
A.B. 1956, Northwestern University
Joseph Allan Cooke — Pa.
B.S. in C.E. 1957, Drexel Institute of Technology
Kelly Ozelle Corley — Va.
B.S. 1955, Mississippi College
William Edward Cox — Va.
A.B. 1954, Bucknell University
Donald Lee Dennison — Md.
B.S. in M.E. 1955, Carnegie Institute of Technology
William B. Dickinson — Va.
A.B. 1958, University of New Mexico
Robert Roy Dively — Va.
A.B. 1957, Pennsylvania State University
Ronald Kaye Dunton — Va.
A.B. 1954, Dartmouth College
Davis Blair Dwinell — D.C.
B.S. 1957, Pennsylvania State University
Robert Hodgskin Erdmann — Vt.
A.B. 1958, University of Vermont
Semi Feuer — D.C.
A.B. 1958, The George Washington University
Jack Lloyd Foltz — Va.
B.S. in Ch.E. 1957, Rose Polytechnic Institute
Donald William Graves — Va.
B.C.E. 1957, Cornell University
Henry G. Green — Va.
A.B. 1958, Louisiana State University and Agricultural and Mechanical College
Roosevelt Browne Greene, Jr. — Va.
A.B. 1958, The George Washington University
Seymour David Gunod — Md.
A.B. in Govt. 1949, The George Washington University
Jack Herbert Hall — Va.
B.Ch.E. 1957, Rensselaer Polytechnic Institute
Ronald Moyer Halvorsen — Va.
B.S. in C.E. 1957, Drexel Institute of Technology
Louis Francis Heeb — Ind.
B.M.E. 1955, General Motors Institute
William Edwin Hegle — Md.
B.S. in F.S. 1949, Georgetown University
Harvey Sander Hertz — Va.
B.S. in E.E. 1955, University of Colorado
Stanley Manuel Hochhauser — N.Y.
A.B. 1958, Brooklyn College
Gary Clark Honeycutt — Va.
B.S. 1954, University of Arkansas
James Joseph Horgan — Del.
B.S. 1957, LaSalle University
Thomas Braden Hunter — Va.
B.S. in Ch.E. 1956, Case Institute of Technology
John David Jackson — Va.
B.S. 1958, University of Maryland
Bernice Harriet Jacobsen — Wis.
Ed.B. 1947, Wisconsin State College, River Falls
A.M. 1954, The George Washington University
Harold Dudley Jastram — Va.
B.S. in E.E. 1957, South Dakota State College of Agriculture and Mechanic Arts
Raymond Eric Johnson — D.C.
B.C.E. 1958, Rensselaer Polytechnic Institute
Charles Sherfy Jones — Va.
B.S. in C.E. 1953, Duke University
Harry Chapman Jones III — Va.
B.S. 1957, Yale University
Clarence Cyrus Keiser, Jr. — Md.
A.B. 1954, University of the South
Walter Kruger — Va.
B.S. in M.E. 1956, Lafayette College
Norman Nathan Kunitz — Pa.
B.S. in E.E. 1957, Drexel Institute of Technology
Clarence Victor LaBonte, Jr. — Mass.
A.B. 1958, Cornell University
Jay Calvin Langston — Mont.
B.S. 1957, Montana State College
Earl Levy — Va.
B.E.E. 1952, Rensselaer Polytechnic Institute
John Jacob Mackiewicz — N.Y.
B.Ch.E. 1957, Yale University
Richard Leo Madden — Va.
B.S. 1956, Indiana University
Philip David Main — Conn.
A.B. 1958, Bates College
Robert Marrero — Va.
A.B. 1958, The George Washington University
Edwin Floyd McDermott — D.C.
A.B. 1951, Denison University
Matthew Kenneth McElhaney — Va.
A.B. 1954, Thiel College
Clifford Johnson Moody — Va.
A.B. 1958, University of New Hampshire
Donald Russell Motsko — Va.
B.S. 1957, Pennsylvania State University
John Herbert Mulholland — Ill.
B.S. 1957, University of Illinois
George Joseph Neilan — Va.
B.E. 1957, Yale University
Charles Robert Nichols — N.M.
A.B. 1958, University of New Mexico
Francis James O'Rourke — Mass.
B.S. 1955, Northeastern University
Thomas Lee Peterson — Va.
B.S. in I.E. 1956, Stanford University
David Pollack — Va.
B.S. in A.E. 1956, University of Miami
Morris Irwin Pollack — Va.
B.S. in M.E. 1954, Newark College of Engineering
Parnell Jearl Porter, Jr. — Va.
A.B. 1958, University of Pittsburgh
Robert Ralph Priddy — Md.
B.S. 1958, Principia College
Jerry Arthur Rabinowitz — N.Y.
A.B. 1958, West Virginia Wesleyan College
John Charles Randa — Wis.
B.S. in E.E. 1957, Marquette University
George Thomas Rawding — N.J.
B.B.A. 1958, Upsala College
Ralph Raymond Reeser, Jr. — Md.
A.B. 1955, University of Washington
S. Jesse Reuben — Va.
A.B. 1958, The George Washington University
Gordon Albert Richardson — Md.
B.S. 1958, The George Washington University

Irwin Bennett Rosenstein — Conn.
B.S. 1958, University of Pennsylvania
Bertram Irwin Rowland — Va.
B.S. 1950, University of California at Los Angeles
Ph.D. 1954, University of Washington
Harold Aram Sakayan — D.C.
B.S. 1957, University of Maryland
Otto Schmid, Jr. — Va.
B.E.E. 1953, Georgia Institute of Technology
William Nelson Schnell — Ill.
A.B. 1958, University of Illinois
Melvin Sharp — Pa.
B.S. in E.E. 1957, Drexel Institute of Technology
Fred Willie Sherling — Tenn.
B.S. in Ch.E. 1957, University of Tennessee
Raymond Stevens Smethurst, Jr. — D.C.
B.Met.E. 1958, Cornell University
Edward Jarrin Snyder — Md.
A.B. 1955, Catholic University of America
Earl Chester Spaeth — Va.
A.B. 1942, Oberlin College
Ph.D. 1946, University of California at Los Angeles
George Pete Stavros — Ky.
A.B. 1958, Centre College
Murray Robert Stein — Md.
B.S. 1953, D.C. Teachers College
Garth A. Stephenson — Md.
A.B. 1951, Brigham Young University
Sheldon Stern — N.Y.
B.S. 1958, New York University
Beverly Joan Stiburek — Idaho
B.S. 1955, Brigham Young University
Steven Faraday Stone — Va.
B.Ch.E. 1957, Rensselaer Polytechnic Institute
Jan Arthur Strompf — Md.
B.S. 1958, University of Maryland
Grant Russell Sykes — D.C.
B.B.A. 1950, Tulane University
A.M. in Govt. 1953, The George Washington University
David Teschner — Va.
B.S. in E.E. 1955, Newark College of Engineering
John Charles Thompson — Va.
B.S. 1957, University of Rochester
William Clarence Thornton — Nev.
A.B. 1958, University of Nevada
Ethan Allen Turshen — N.Y.
A.B. 1954, Kenyon College
M.P.A. 1955, Syracuse University
John Klaas Uilkema — Va.
B.S. in M.E. 1957, University of Michigan
John Perley Vandenburg — Mich.
B.S. in E.E. 1956, University of Michigan
Franklin Joseph Visek — Nebr.
B.S. in B.A. 1957, Municipal University of Omaha
John Robert Waller — Md.
B.S. 1953, Georgetown University
Robert George Weilacher — Va.
B.S. 1957, Columbia University
John Edward Welch — Maine
B.S. in Agron. 1953, University of Maine
Melvin Pearson Williams — Va.
B.E.E. 1957, Rensselaer Polytechnic Institute
Warren Jay Willinger — N.Y.
A.B. in Govt. 1959, The George Washington University
Betty Marie Wisecarver — Va.
A.B. 1957, Mary Washington College
William Henry Witt — Md.
A.B. 1941, Harvard University
Raymond Leroy Worthington — Md.
B.S. 1941, University of Maryland
Robert Lloyd Zieg — Va.
B.I.E. 1956, General Motors Institute

October 21, 1961

Claude Leo Beaudoin — Md.
B.S. 1956, University of New Hampshire
Robert Ellis Best — Va.
B.B.A. 1954, University of Oklahoma
Samuel Herman Blech — Md.
B.S. 1950, Brooklyn College
Jack Lee Bohan — Va.
B.Met.E. 1956, Rensselaer Polytechnic Institute
Stewart Dawson Burton — Utah
A.B. 1951, Brigham Young University
Robert Allen Cahill — Wis.
B.S. in E.E. 1956, University of Wisconsin
Donald Eugene Campbell — Colo.
A.B. 1959, The George Washington University
Edgar Ronald Coffman — Va.
B.S. in M.E. 1958, University of Michigan
Rodger Duane Collons — Va.
B.S. in C.E. 1957, University of Texas
George Edward Cranwell — N.J.
B.S. 1954, Saint Peter's College
Lewis McClellan Dalgarn — Va.
B.E.E. 1957, Vanderbilt University
Héctor Dávila-Román — Puerto Rico
A.B. 1958, Inter American University of Puerto Rico
Maurizio Furio De Martino — D.C.
A.B. 1958, The George Washington University
Robert Abel Dennison, Jr. — Va.
B.C.E. 1948, Rensselaer Polytechnic Institute
James Frederick Doak — Okla.
A.B. 1956, University of Kansas
Joseph Franklin Dugan — N.J.
A.B. 1957, Pennsylvania State University
George Cordell Easter — Mass.
A.B. 1956, Princeton University
Alfred Paul Ewert — Va.
B.S. in E.E. 1955, University of Michigan
Vincent James Femia — Md.
A.B. 1959, The George Washington University
Edmund Eugene Fleming — Iowa
B.S. in F.S. 1959, Georgetown University
Bernard S. Gild — D.C.
B.B.A. 1957, University of Pittsburgh
Morton Norman Goldstein — D.C.
A.B. 1957, University of Maryland
James Edward Harvey, Jr. — Fla.
B.M.E. 1940, Tulane University
M.B.A. 1948, Harvard University
James Edmond Hawes — D.C.
B.S. in E.E. 1957, University of Illinois
William H. Holt — Va.
B.S. in Eng. 1957, The George Washington University
Carter Carol Hubbel, Jr. — Md.
A.B. 1959, University of Maryland
James Rozier Hulen, Sr. — Va.
B.S. in M.E. 1958, University of Missouri
Herbert Kenneth Hyde, Jr. — Okla.
A.B. 1955, University of Oklahoma
Peter Isakov — Ohio
B.Ch.E. 1958, University of Cincinnati
Vernon Webster Johnson, Jr. — Md.
A.B. 1956, Duke University

John Tyden Ketcham — Va.
A.B. in Govt. 1958, The George Washington University

John Arthur Koch — D.C.
B.I.E. 1954, Ohio State University

John Frederick Kovin — Md.
A.B. 1958, Washington Missionary College

Anthony Thomas Lane — Va.
B.E.E. 1957, The George Washington University

Stuart Lubitz — Mich.
B.I.E. 1957, B.M.E. 1958, University of Florida

John Raymond Manning — Iowa
B.S. in Eng. 1957, The George Washington University

James Francis McCarthy — Mass.
A.B. 1956, Boston University

John Joseph McCormack — Mass.
B.S. 1954, Boston College

John R. Nordstrom — N.D.
A.B. 1949, Minnesota State College, Moorhead
A.M. 1958, University of Minnesota

Edward William Nypaver — D.C.
B.S. in C.E. 1957, University of Pittsburgh

Dennis Edward Watson O'Connor — Hawaii
B.S. 1952, U.S. Naval Academy

Gordon Harold Olson — Va.
B.S. 1955, North Dakota State University

Alan Gilbert Paul — Va.
B.M.E. 1956, Rensselaer Polytechnic Institute

John Joseph Posta, Jr. — Va.
B.S. in Eng. 1957, The George Washington University

Warren Estes Ray — D.C.
B.S in E.E. 1952, M.S. in E.E. 1956, Oklahoma State University

Ronald William Reagin — Va.
B.S. 1958, University of Missouri

Wayland Henry Riggins — Va.
B.S. 1956, Clemson Agricultural College

Robert H. Rusis — Md.
A.B. 1956, The George Washington University

Donald Waters Seiler, Jr. — Va.
A.B. 1956, College of William and Mary

Edward Lawrence Sherman — Md.
A.B. 1951, A.M. 1953, Roosevelt University

Donald James Singer — Md.
B.S. in Ch.E. 1956, Michigan State University of Agriculture and Applied Science

Daniel Warren Sixbey — Md.
A.B. 1954, University of Maryland

Marvin Snyder — D.C.
B.E.E. 1954, Cornell University

George Vande Sande — Md.
B.S. in E.E. 1948, University of Michigan

Roger Alan Van Kirk — N.J.
B.S. in E.E. 1957, University of Vermont

Alan David Wolfe — N.Y.
B.S. 1952, Queens College
M.S. 1956, Massachusetts Institute of Technology

James Creighton Wray — N.Y.
B.M.E. 1958, Villanova University

Francis Kopp Zugel — Md.
B.S. in Eng. 1957, The George Washington University

Bachelor of Laws in National University

June 7, 1961

Leon B. Zeiger — D.C.

Juris Doctor

February 22, 1961

Hugh Yancey Bernard, Jr. — Va.
A.B. 1941, University of Georgia
B.S. 1947, Columbia University

Alfred Fearing Bridgman, Jr. — Mass.
B.S. 1954, U.S. Coast Guard Academy

Stanley Howard Cohen — Md.
B.S. 1957, Drexel Institute of Technology

Sheldon Feldman — Md.
A.B. 1957, The George Washington University

Harvey Jack Gordon — Md.
B.B.A. 1952, College of the City of New York
M.P.A. 1956, Harvard University

Eugene Gary Horowitz — D.C.
A.B. in Govt. 1958, The George Washington University

John Christian LaPrade — Va.
B.S. 1957, New Mexico College of Agriculture and Mechanic Arts

Francis Arthur Paintin — Ohio
B.S. in Ch.E. 1951, Case Institute of Technology

Arnold Edward Renner — Va.
B.S. in E.E. 1954, Purdue University

June 7, 1961

George LaVern Albright — Nev.
B.S. 1954, Brigham Young University

Lawrence Herbert Berul — Md.
B.S. in Com. 1957, Drexel Institute of Technology

Harold Randall Bixler — Va.
A.B. 1957, Michigan State University of Agriculture and Applied Science

Joseph Vincent Colaianni — Mich.
B.E.E. 1956, University of Detroit

Gene Oliver Enockson — N.D.
B.S. 1954, Jamestown College

James Peter Gregory — Conn.
A.B. 1956, Brown University

Clyde Henry Hamilton, Jr. — S.C.
B.S. 1956, Wofford College

Janet Goldrich Kohn — D.C.
(With distinction)
A.B. 1951, Antioch College

James Edwin Lemert — Ohio
B.S. in E.E. 1957, Purdue University

William Woods McDowell, Jr. — Md.
(With distinction)
B.E. 1953, Johns Hopkins University

Gerald Joseph Mossinghoff — Va.
B.S. in E.E. 1957, St. Louis University

Robert R. Perko — Va.
B.S. in F.S. 1950, Georgetown University

Michael Terry Platt — N.Y.
B.E.E. 1957, Rensselaer Polytechnic Institute

George Richard Powers — Va.
B.S. 1957, University of Illinois

Jenny Krohn Rose — N.J.
A.B. 1958, Hood College

Charles H. Schwartz — Pa.
B.S. in E.E. 1957, Drexel Institute of Technology

Kenneth John Sherk — Iowa
B.S. in Conn. 1955, State University of Iowa

Natalie Trousof — D.C.
A.B. 1947, A.M. 1950, Columbia University

William Edward Watson — W.Va.
A.B. 1958, West Virginia Wesleyan College

James William Williams — Va.
B.S. in E.E. 1957, Vanderbilt University

Robert Wayne Wise — Va.
B.S. 1956, McPherson College

October 21, 1961

Vida Marie Baugh — D.C.
A.B. 1950, University of Idaho

George Dennis Becker — Md.
A.B. 1956, Swarthmore College

William Sanford Corey — Md.
A.B. 1958, Dickinson College

Margaret Leslie Ervin — N.C.
A.B. 1952, University of North Carolina

John Smith Jenkins — Pa.
A.B. 1954, Lafayette College

George William King — Va.
B.S. in E.M. 1957, West Virginia University

Martin M. Krawiec — N.Y.
B.S. 1958, Cornell University

John Frederick Moring — Va.
B.S. in I.E. 1957, Virginia Polytechnic Institute

John Joseph Mullins, Jr. — Mass.
B.S. in C.E. 1956, University of Connecticut

Daniel Y. Sachs — N.Y.
B.S. 1955, Cornell University

James Clement Schultz — Nebr.
B.S. 1956, University of Nebraska

William John Swartz — Va.
B.S. in M.E. 1956, Duke University

Master of Laws

February 22, 1961

Charles Gailord Luellman — Nebr.
A.B. 1952, LL.B. 1958, University of Nebraska

Les J. Weinstein — Pa.
B.S. in M.E. 1956, University of Pennsylvania
J.D. 1959, The George Washington University

June 7, 1961

J. Francis Fowles, Jr. — N.M.
B.S. 1946, University of Idaho
LL.B. 1949, University of Utah

John Charles Lyons — Va.
A.B. 1956, University of Rhode Island
LL.B. 1960, Georgetown University

Jack Harvey Olender — Pa.
A.B. 1957, LL.B. 1960, University of Pittsburgh

Vernon Amos Peltzer — Ill.
A.B. 1941, Depauw University
J.D. 1953, The George Washington University

Daniel Joseph Sammon — Ohio
B.S. in E.A. 1957, Case Institute of Technology
LL.B. 1960, Georgetown University

Julius Elwood Slover — Mo.
B.S. in Ed. 1942, Southeast Missouri State College
LL.B. 1947, University of Texas

October 21, 1961

David William Johnson — N.Y.
B.S. 1952, Brooklyn College
LL.B. 1959, The George Washington University

Mordecai C. Johnson — S.C.
A.B. 1951, South Carolina State College
LL.B. 1959, Howard University

Master of Comparative Law

February 22, 1961

Raden Mohamad Sudjiman — Indonesia
M.L. 1948, Kyoto University, Japan

Doctor of Juridical Science

June 7, 1961

Gordon A. Christenson — Utah
B.S.L. 1955, LL.B. 1956, University of Utah
Dissertation: "Individuals before International Tribunals: Direct Access in Private Matters."

STUDENTS REGISTERED IN THE LAW SCHOOL

A

Abato, Anthony A. — Md.
A.B. 1955, University of Maryland

Adams, Don T. — Va.
B.C.E. 1957, University of Florida

Addams, Nicholas A. — N.J.
B.S. in E.E. 1960, Newark College of Engineering

Ake, Charles P. — Ga.
B.S. 1955, Villanova University

Albright, George L. — Va.
B.S. 1954, Brigham Young University

Allen, Dillis V. — Ill.
B.S. in M.E. 1960, University of Wisconsin

Allen, Kenneth D. — Mo.
A.B. 1960, Central Missouri State College

Allio, William H. — Miss.
A.B. 1960, University of Mississippi

Allnut, Robert F. — Va.
B.S. in I.E. 1957, Virginia Polytechnic Institute

Allsbrook, Robert C. — Pa.
B.B.A. 1961, University of Pittsburgh

Alpert, Allen S. — Fla.
B.I.E. 1961, University of Florida

Alvey, Ralph J. — D.C.
B.S. 1950, University of Colorado

Anderson, Billy R. — Wyo.
B.S. 1960, Brigham Young University

Andrews, George E. — Md.
A.B. 1960, University of Maryland

Angier, Anna P. — Tenn.
A.B. 1944, Maryville College of the Sacred Heart

Antonelli, Donald R. — Va.
B.S. in E.E. 1957, Purdue University

Antonelli, Joseph M. — Md.
B.S. 1960, University of Maryland

Aranoff, Robert I. — Fla.

Armstrong, Richard V. — Okla.
A.B. 1958, University of Oklahoma

Aron, Lewis G. — R.I.
B.S. 1959, Brown University

Arvidson, Philip R. — W.Va.
B.S. 1961, Oklahoma State University

Asay, Linda H. — Kans.
A.B. 1960, University of Oklahoma

Asher, Robert S. — N.Y.
B.S. 1958, College of the City of New York

Ashland, Calvin K. — Iowa
B.S. 1957, Iowa State College of Agriculture and Mechanic Arts

Asleson, Robert F. — Minn.
B.S., B.B.A. 1958, University of Minnesota

Aston, William M. — W.Va.
A.B. 1953, St. John's College

Astor, Sanford — Ind.
B.S. in Ch.E. 1958, Purdue University

B

Baca, Joseph F. — N.M.
A.B. in Ed. 1960, University of New Mexico

Baggott, William K. — Va.
B.S. in I.E. 1957, West Virginia University

Baker, Patrick C. — Mich.
A.B. 1956, Catholic University of America

Balistreri, Salvatore C. — Calif.
B.S. 1961, San Francisco State College

Band, David S. — D.C.
B.S. 1958, University of Maryland

Bannasch, Norma T. — Mich.
A.B. 1957, University of Michigan

Barnes, Andrew M. — D.C.
A.B. 1955, Middlebury College

Barone, Vito S. — Mich.
B.Ch.E. 1960, University of Detroit

Barrand, Kerwood W. — Oreg.
B.S. 1954, U.S. Military Academy
M.S. 1960, University of Missouri School

Barriage, Joan B. — Va.
B.S. in A.E. 1951, Purdue University

Barron, Melvin — Mass.
A.B. 1961, Boston University

Barsky, Ira P. — N.Y.
B.S. 1959, New York University

Barth, Charles A. — Va.
A.B. 1952, LL.B. 1954, Indiana University

Bartl, Richard A. — Ind.
B.S. 1957, Purdue University

Baugh, Vida M. — Idaho
A.B. 1950, University of Idaho

Baynham, Robert J. — Pa.
B.S. in M.E. 1959, University of Pittsburgh

Beach, Donald F. — D.C.
B.B.A. 1961, The George Washington University

Beall, Thomas E., Jr. — Md.
B.S. 1960, University of Maryland

Bean, James L. — Va.
B.S. in C.E. 1950, Tennessee Polytechnic Institute

Bean, Wiley E. — Mich.
A.B. 1960, Michigan State University of Agriculture and Applied Science

Beatley, Charles E., Jr. — Va.
A.B. 1938, M.B.A. 1947, Ohio State University

Beatman, James W. — Va.
A.B. 1948, Oberlin College
A.M. 1949, University of Pennsylvania

Beaudoin, Claude L. — Md.
B.S. 1956, University of New Hampshire

Beck, Andrew — Ill.
B.S. 1956, Virginia Polytechnic Institute

Beck, Richard M. — N.Y.
B.M.E. 1960, Rensselaer Polytechnic Institute

Beck, William R. — Va.
A.B. 1960, University of Miami

Becker, George D. — Md.
A.B. 1956, Swarthmore College

Becker, Roland W. — Va.
A.B. 1958, The George Washington University

Beerman, Bernard M. — Md.
A.B. 1959, Princeton University

Bell, Harry C. — N.Y.
B.S. 1957, Georgetown University

Bell, Rodland G. — Va.
B.S. 1961, Oregon State University

Beller, Margaret A. — Md.
A.B. 1955, A.M. 1957, The George Washington University

Belser, Townsend M., Jr. — S.C.
B.Ch.E. 1958, Georgia Institute of Technology

Bender, Sheldon M. — N.Y.
B.M.E. 1961, College of the City of New York

Bendere, George H. — N.J.
A.B. 1960, Lafayette College

Bennett, Robert C., Jr. — Texas
A.B. 1961, Agricultural and Mechanical College of Texas

Bennison, John C. — N.D.
A.B. 1961, Pomona College

Benson, Charles W. D.C.
B.S. 1955, Rutgers University
Benson, Ingram T. Va.
A.B. 1936, Carleton College
Bentzman, Marshall R. Mass.
B.S. in B.A. 1956, American International College
Berg, Egon E. N.J.
B.S. 1959, Rutgers University
Bernard, Lawrence J., Jr. Md.
B.S. 1960, University of North Carolina
Berneike, Richard H. N.Y.
B.S. in Ch.E. 1958, Purdue University
Bernens, John C. Va.
B.S. 1948, Xavier University
M.S. 1949, University of California
Bernstein, Saul H. Md.
B.S. in Eng. 1957, University of Maryland
Berrier, Erwin F., Jr. Ind.
B.S. in M.E. 1960, Purdue University
Berul, Lawrence H. N.J.
B.S. in Com. 1957, Drexel Institute of Technology
Berzins, Ivars Mich.
B.S. 1958, Michigan College of Mining and Technology
Best, Robert E. Va.
B.B.A. 1954, University of Oklahoma
Betts, Carolyn Va.
B.S. 1954, North Texas State College
Beyda, Cohen R. D.C.
A.B. in Govt. 1959, The George Washington University
Bielawski, David Va.
A.B. 1955, University of North Carolina
Biggert, Rody P. Ill.
A.B. 1958, Amherst College
Billings, Roger D., Jr. N.J.
A.B. 1959, Wabash College
Binns, Norman B. Wash.
B.S. 1949, U.S. Coast Guard Academy
Birch, Terrell C. Md.
B.E.E. 1959, The George Washington University
Bisson, Barry Gale A. N.H.
B.S. 1956, University of New Hampshire
Bisson, Gary B. N.H.
A.B. 1959, University of New Hampshire
Bitner, George E. Va.
A.B. 1961, Ohio Wesleyan University
Bixler, Harold R. Va.
A.B. 1957, Michigan State University of Agriculture and Applied Science
Bjorge, Gerald H. S.D.
B.S. in C.E. 1959, Northwestern University
Bjorge, Sara E. N.D.
B.S. 1959, Iowa State University of Science and Technology
Black, Wayne V Mo.
B.S. 1959, University of Missouri
Blanchard, Albert C. Maine
A.B. 1958, Yale University
Blech, Samuel H. D.C.
B.S. 1950, Brooklyn College
Bliss, Laurence T. Ala.
B.S. 1956, University of Alabama
Block, Daniel C. Va.
B.S. 1957, Texas College of Arts and Industries
Blondin, Carmen J. Alaska
B.S. 1955, U.S. Coast Guard Academy
Blood, Russell M. D.C.
A.B. 1951, University of California
Boardman, Harold F., Jr. Pa.
B.S. 1961, Trinity College
Bohan, Jack L. Va.
B.Met.E. 1956, Rensselaer Polytechnic Institute
Bond, Eugene M. Ohio
B.Ch.E. 1959, Ohio State University
Bond, Robert T. Md.
A.B. 1954, Southern Missionary College
Bonfanti, Reno E. D.C.
A.B. 1953, University of Pittsburgh
Booth, Henry H. D.C.
A.B. 1957, University of North Dakota
Bound, Arthur E. Fla.
B.S. in B.A. 1953, University of Florida
Bourdon, Reginald A. D.C.
B.S. in F.S. 1960, Georgetown University
Brand, Joseph L. Ohio
A.B. 1958, University of Michigan
A.M. 1959, Ohio State University
Branigan, Alan E. Va.
B.S. in M.E. 1959, University of Colorado
Branscomb, Anne W. Md.
A.B. 1949, Georgia State College for Women
Brass, Ronald B. D.C.
A.B. 1955, Brooklyn College
Braun, Howard W. Pa.
A.B. 1956, Colgate University
Brezina, Edward S. D.C.
M.D. 1948, University of Southern California
Brigens, Burton G. Iowa
A.B. 1941, State University of Iowa
Broadhead, William S. Md.
A.B. 1956, Idaho State College
Brown, Donald C. Md.
A.B. 1952, University of Vermont
Brown, Dulcey A. Va.
A.B. 1957, The George Washington University
Brown, Porter K. Kans.
A.B. 1961, University of Kansas
Bryan, David C. Va.
B.S. in B.A. 1955, Georgetown University
Bryant, Willard E. Mich.
B.S.E. 1958, University of Michigan
Brzozowski, Edmund Md.
B.E.E. 1950, The George Washington University
Buck, Richard S. Md.
A.B. 1958, University of Maryland
Buckley, Helen B. Va.
B.S. 1949, The George Washington University
Buff, Ralph M. Va.
A.B. 1958, Ohio University
Bullin, Melvin L. Md.
A.B. 1960, University of Maryland
Bullock, Charles A. Pa.
A.B. 1954, Franklin and Marshall College
Burghardt, Raymond F. N.J.
A.B. 1960, Kenyon College
Burnett, Robert F. S.C.
B.S. 1956, Clemson Agricultural College
Burton, Stewart D. Utah
A.B. 1951, Brigham Young University
Bushnell, Gene R. S.D.
A.B. 1960, University of South Dakota
Butler, Charles F. D.C.
A.B. 1959, Boston University
Butowsky, David M. Md.
A.B. 1958, Temple University

C

Cacciapaglia, Frank, Jr. Va.
B.S. 1947, University of Notre Dame
Cahill, Robert A. Wis.
B.S. in E.E. 1956, University of Wisconsin
Callihan, Herbert A., Jr. N.C.
A.B. 1955, University of North Carolina
Calloway, James R. Del.
A.B. 1959, The George Washington University
Cammack, Ernest G., Jr. Ga.
B.S. in I.M. 1959, Georgia Institute of Technology
Campbell, Donald E. Colo.
A.B. 1959, The George Washington University

Campbell, Lawrence R. D.C.
B.S. 1956, University of Arizona
Caplan, Donald M. Md.
B.S. 1954, University of Maryland
Caplan, Joel B Va.
A.B. 1949, State University of Iowa
M.S. 1951, B.S. in Pharm. 1957, The George Washington University
Capp, Alvin Fla.
A.B. 1961, The George Washington University
Cappellari, Joseph S. W.Va.
B.B.A. 1957, Marshall College
Cappucci, Albert A. N.Y.
A.B. 1960, M.B.A. 1961, Cornell University
Carney, John F. Mass.
B.S. 1957, Northeastern University
Carter, Joseph L. Md.
B.S. 1958, Maryland State Teachers College, Frostburg
Carter, Ronald G. Idaho
A.B. 1957, Brigham Young University
Carver, Harry S. Va.
A.B. 1955, College of William and Mary
Carvey, David C. D.C.
A.B. 1955, Pennsylvania State University
Casey, Edward H. Okla.
B.S. 1947, University of Oklahoma
Casey, James E. Va.
B.S. 1957, Roosevelt College
M.B.A. 1957, University of Chicago
Castellano, Joseph N.Y.
A.B. 1959, Princeton University
Catalano, Richard M. Pa.
A.B. 1955, Bowdoin College
A.M. 1958, Tufts University
Catchick, James M. Mich.
A.B. 1961, University of Michigan
Cavros, Steve N. D.C.
B.E.E. 1953, Georgia Institute of Technology
Centola, David D. N.J.
B.S. 1949, Fordham University
Chabrow, Penn Pa.
B.S. 1960, Muhlenberg College
Chalupsky, Fred A. Iowa
A.B. 1939, J.D. 1941, State University of Iowa
Chamberlain, Milton K. W.Va.
A.B. 1957, West Virginia University
Champion, William M. Miss.
B.S. 1953, Mississippi State University
LL.B. 1961, University of Mississippi
Chandler, George P. Md.
B.S. 1956, University of Tennessee
Cheever, Alan W. Vt.
B.S. 1958, New England College
Cherryman, Rexford R Va.
A.B. 1960, College of William and Mary
Chess, Richard B. Va.
A.B. 1957, Tufts University
Christensen, Gordon A. Va.
B.S. 1955, LL.B. 1956, University of Utah
Church, Lawrence B. Va.
A.B. 1959, The George Washington University
Ciancioni, John A. N.Y.
A.B. 1956, University of Rochester
Cisna, Frances L. D.C.
B.S. 1950, A.M. 1952, The George Washington University
Clampitt, Richard N. D.C.
B.S. 1960, American University
Clark, Barry L. Va.
B.S. in M.E. 1956, Northwestern Technological Institute
Clark, Robert B. D.C.
A.B. 1949, Harvard University
Clatterbuck, Dean S. D.C.
A.B. in Govt. 1960, The George Washington University
Clausen, Lynn M. Md.
A.B. 1956, Michigan State University of Agriculture and Applied Science
Clingan, Thomas A. Maine
B.S. 1950, U.S. Coast Guard Academy
Cobb, Alan E. D.C.
B.S. 1954, Bowling Green State University
Coble, Paul M. D.C.
B.S. 1957, M.S. 1958, Massachusetts Institute of Technology
Cocks, Kenneth A. Texas
B.S. in I.E. 1959, Washington University
Coffman, Edgar R. Va.
B.S. in M.E. 1958, University of Michigan
Coffman, Gordon C. Utah
A.B. 1959, Brigham Young University
Cohen, Jerry D.C.
B.M.E. 1957, Rensselaer Polytechnic Institute
Colaianni, Joseph V. Mich.
B.E.E. 1956, University of Detroit
Cole, Lon T. D.C.
A.B. 1950, University of New Mexico
Coleman, Roger E., Jr. Va.
A.B. 1960, Mississippi Southern College
Collins, Josiah W. Ill.
B.S. 1955, U.S. Naval Academy
Collins, Richard W. Okla.
B.S. 1956, Oklahoma State University of Agriculture and Applied Science
Collons, Rodger D. Va.
B.S. in C.E. 1957, University of Texas
Comstock, Austin B. Va.
A.B. 1956, Northwestern University
Conlon, Michael C. Md.
A.B. 1954, Lafayette College
Connors, Edward J., Jr. Mass.
B.S. 1954, University of Notre Dame
LL.B. 1959, Georgetown University
Constant, Richard E. N.Y.
B.S. in E.E. 1959, University of Colorado
Constantinople, James D. D.C.
A.B. 1957, Amherst College
Cook, Paul J. Fla.
B.Mgt.E. 1960, Rensselaer Polytechnic Institute
Cook, Patrick T., Jr. Md.
A.B. 1960, Beloit College
Cooke, Joseph A. Pa.
B.S. 1957, Drexel Institute of Technology
Cooke, Phillip A. N.Y.
A.B. 1961, University of Washington
Cooper, George M. Va.
B.S. 1957, Pennsylvania State University
Cooper, Hal D. Iowa
B.S. 1957, State University of Iowa
Copeland, Milton H. Texas
A.B. 1958, Abilene Christian College
Corey, William S. Md.
A.B. 1958, Dickinson College
Corley, Kelly O. Va.
B.S. 1955, Mississippi College
Corry, Robert E., Jr. Ala.
A.B. 1957, University of Alabama
Corsini, Timothy A. Va.
B.S. 1959, Fairmont State College
Costello, Roger J. Va.
A.B. 1948, University of Cincinnati
M.B.A. 1951, Harvard University
Coughlan, Joseph D., Jr. N.Y.
A.B. 1955, Princeton University
Coughlan, Paul M., Jr. D.C.
B.S. 1951, University of Maryland
Coult, John H. Pa.
B.S. in E.E. 1961, Pennsylvania State University
Cowden, Joseph M. Mich.
B.S. 1954, Iowa State College of Agriculture and Mechanic Arts
Cowherd, Yelverton, Jr. D.C.
B.S. 1956, University of Maryland

Cowley, Elmer — Fla.
A.B. 1961, Duke University
Cowley, Samuel P. — Utah
B.S. 1959, University of Utah
Cox, William E. — Va.
A.B. 1954, Bucknell University
Coxen, Edward D. — D.C.
A.B. 1960, The George Washington University
Craft, John C. — Nebr.
A.B. 1961, University of Nebraska
Crafton, Paul A. — D.C.
B.M.E. 1944, College of the City of New York
M.S. 1950, Ph.D., 1956, University of Maryland
Cramer, Richard B. — Pa.
A.B. 1959, University of Michigan
Cramp, Barry S. — N.J.
A.B. 1958, Colgate University
Cranford, Page D. — Md.
B.S. 1958, Washington and Lee University
Cranwell, George E. — Md.
B.S. 1954, St. Peter's College
Crawford, Robert J. — Va.
B.S. in E.E. 1957, Virginia Polytechnic Institute
Crawford, Thomas H. — Calif.
A.B. 1959, Stanford University
Creer, John P. — Utah
B.S. 1957, University of Utah
Criddle, Byron D. — Va.
B.S. 1956, Utah State University of Agriculture and Applied Science
Cridlin, William B. — Va.
B.S. 1955, Virginia Military Institute
Cronin, Paul F. — Mass.
B.S. 1955, University of Massachusetts
Crookston, Norbert J., Jr. — D.C.
B.S. 1950, M.S. 1952, Virginia Polytechnic Institute
Crutchfield, Sam S., Jr. — D.C.
A.B. 1960, The George Washington University
Cunningham, Robert T., Jr. — Ohio
B.S. in M.E. 1960, Purdue University
Curry, David — Ill.
B.S. 1960, Washington University

D

Daisley, William P. — Md.
A.B. 1959, Randolph-Macon College
Dalgarn, Lewis M. — La.
B.S. 1957, Vanderbilt University
Daly, Fred H. — Conn.
B.S. 1960, Fordham University
Daniel, Dorris C., Jr. — Va.
A.B. 1957, American University
Daniels, Edwin H. — Fla.
B.S. 1953, U.S. Coast Guard Academy
Davila, Roman H. — D.C.
A.B. 1958, Inter-American University, Puerto Rico
Davis, Frank T., Jr. — Ga.
A.B. 1960, Princeton University
Davis, George C. — Va.
A.B. 1959, LL.B. 1961, American University
Davis, Jacob B. — Md.
B.S. 1958, University of Maryland
Davis, James C. — N.Y.
B.S.E. 1955, Brown University
Davis, Marvin S. — Pa.
B.S. 1961, Temple University
Davis, Michael H. — Utah
B.S. 1958, Utah State University of Agriculture and Applied Science
Dawson, Thomas H. — Iowa
A.B. 1960, University of Wyoming
Debenham, Shirle A. — Utah
A.B. 1959, University of Utah
Delavigne, Kenneth T., Jr. — D.C.
A.B. 1961, Georgetown University
DeLorenzo, Richard A. — N.Y.
B.S. 1959, Fordham University
DeMartino, Maurizo F. — D.C.
A.B. in Govt. 1958, The George Washington University
DeMelto, Vincent K. — Ohio
A.B. 1960, Marquette University
Dempsey, John E. — Va.
B.S. 1956, LeMoyne College
Dennison, Donald L. — Md.
B.S. 1955, Carnegie Institute of Technology
Dennison, Robert A. — N.Y.
B.C.E. 1948, Rensselaer Polytechnic Institute
Dewey, William D. — Va.
A.B. 1959, Western Maryland College
Dewhirst, John W. — Va.
B.I.E. 1960, Georgia Institute of Technology
Dickey, William L. — S.D.
A.B. 1957, Augustana College
Dickinson, William B. — N.M.
A.B. 1958, University of New Mexico
Dickson, Wallace G. — N.J.
A.B. 1959, The George Washington University
Dively, Robert R. — Pa.
A.B. 1957, Pennsylvania State University
Dix, Robert E. — Va.
A.B. 1961, The George Washington University
Dixon, Ronald O. — Va.
A.B. 1959, Brigham Young University
Doak, James F. — Okla.
A.B. 1956, University of Kansas
Dobbins, Thomas O. — Ohio
B.S. 1956, West Virginia University
M.S. 1959, Ohio State University
Dodd, William H., Jr. — Va.
A.B. 1959, College of William and Mary
Doherty, Robert J. — Mass.
B.S. in Ch.E. 1957, Northwestern University
Dolan, George B., Jr. — Fla.
A.B. 1961, The George Washington University
Dorius, Dale M. — Utah
B.S. 1961, Brigham Young University
Dorr, Donald W. — Nebr.
A.B. 1961, Nebraska Wesleyan University
Dougherty, Clifford A. — Va.
B.S. in Agr. 1937, Montana State College
Dowrey, Carl G. — Va.
B.S. 1957, Montana State College
Drews, Norbert H. — Md.
A.B. 1955, University of Maryland
Driker, Eugene — Mich.
A.B. 1959, J.D. 1961, Wayne State University
Driscoll, Raymond A. — Md.
A.B. 1939, St. John's University
Duckworth, Robert W. — Fla.
B.I.E. 1957, University of Florida
Dugan, Joseph F. — N.J.
A.B. 1957, Pennsylvania State University
Duke, Albert F. — Ala.
B.E.E. 1958, Alabama Polytechnic Institute
Duncan, George C. — Va.
B.S. 1939, U.S. Naval Academy
M.S. 1947, Massachusetts Institute of Technology
Duncan, John C., III — Mass.
B.S. 1960, Tufts University
Duncan, John R., Jr. — D.C.
B.S. in Ch.E. 1956, South Dakota School of Mines and Technology
Dunton, Ronald K. — N.J.
A.B. 1954, Dartmouth College
Dupont, Clyde S. — Hawaii
B.S. 1959, Brigham Young University

Durand, Jean Yves — Canada
A.B. 1955, University of Ottawa, Canada
Licentiate in Law 1959, University of Montreal

Durland, William R. — Va.
A.B. 1953, Bucknell University
LL.B. 1959, Georgetown University

Dwinell, Davis B. — D.C.
B.S. 1957, Pennsylvania State University

E

Earle, William K. — Pa.
B.S. 1940, U.S. Coast Guard Academy
J.D. 1949, The George Washington University

Easter, George C. — Ariz.
A.B. 1956, Princeton University

Eatherton, Lewis H. — Va.
B.S. in P.E. 1958, University of Tulsa

Ebert, Paul B. — Va.
B.S. 1959, Virginia Polytechnic Institute

Edwards, Benjamin F. — Md.
A.B. 1950, Yale University

Edwards, Daniel J. — Va.
A.B. 1957, Brown University

Edwards, Malcolm K. — Ind.
A.B. 1955, Wabash College

Egan, Donald E. — N.J.
B.S. 1956, Pennsylvania State University

Ehrenfreund, Melvin J. — N.Y.
A.B. 1960, University of Connecticut

Ehrenkranz, Philip R. — Fla.
A.B. 1960, Ohio State University

Ehrlich, Richard S. — D.C.
A.B. 1955, Harvard University

Eichelburg, Robert J. — N.J.
B.S. 1956, Fordham University

Eichler, John A. — Md.
B.S. 1957, University of Maryland

Eigles, Henry — N.Y.
B.S. 1959, Washington University

Eisen, Bruce M. — Minn.
A.B. 1959, Cornell University

Eisner, Jerome — Md.
B.S. 1953, The George Washington University
M.S. 1956, Georgetown University

Elderkin, Charles B. — Ohio
B.S. in M.E. 1960, Purdue University

Eliasson, Brian L. — Mich.
B.S. 1959, Michigan College of Mining and Technology

Ellert, Robert B. — Va.
A.B. 1947, B.C.L. 1949, College of William and Mary

Ellingsberg, Donald J. — Md.
B.S. 1955, North Dakota Agricultural College

Elliott, Robert M. — Pa.
B.S. 1961, Pennsylvania State University

Ellis, John P. — Pa.
A.B. 1954, Allegheny College

Elwell, Richard B. — N.Y.
A.B. 1953, University of Virginia

Engelberg, Alfred B. — N.J.
B.S. in C.E. 1961, Drexel Institute of Technology

Engle, Fred J., III — D.C.
A.B. 1960, The George Washington University

Engle, John D. — Ohio
A.B. 1961, Miami University

Enockson, Gene O. — N.D.
B.S. 1954, Jamestown College

Ephraim, Allan M. — Okla.
B.B.A. 1955, University of Oklahoma

Eppner, Gerald A. — N.Y.
B.Mgt.E. 1959, B.M.E. 1960, Rensselaer Polytechnic Institute

Erdmann, Robert H. — Va.
A.B. 1958, University of Vermont

Erickson, Donald W. — Mass.
B.S. 1958, University of Michigan

Erickson, Roger J. — Va.
B.S. 1957, Wisconsin State College

Ervin, Margaret L. — N.C.
A.B. 1952, University of North Carolina

Espe, James E. — Iowa
B.S. 1959, Bradley University

Evans, Joyce L. — Va.
A.B. 1952, The George Washington University

Evans, Larry W. — Ind.
B.S. in Ch.E. 1961, Purdue University

Ewert, Alfred P. — Mich.
B.M.E. 1955, University of Michigan

F

Fahs, Gerald R. — Md.
B.S. 1955, Wheaton College
M.D. 1959, Temple University

Farabow, Ford F. — S.C.
B.S. 1959, Clemson Agricultural College

Farley, Richardson B. — Va.
B.S. 1952, B.S. in M.E. 1959, Pennsylvania State University

Farmer, Paul C. — W.Va.
B.S.Eng.Mgt. 1956, West Virginia University

Faulconer, Drude — D.C.
B.S. 1958, University of Oklahoma

Faw, Price C., Jr. — Va.
B.M.E. 1954, Clemson Agricultural College

Fears, Terrell W. — Ala.
B.E.E. 1960, University of Virginia

Fehnel, Paul O. — Md.
B.S. in Phar. 1954, Temple University

Fein, Bruce F. — Fla.
B.B.A. 1960, M.B.A. 1961, University of Miami

Feldman, David E. — D.C.
A.B. in Govt. 1961, The George Washington University

Femia, Vincent J. — D.C.
A.B. in Govt. 1939, The George Washington University

Ferris, Charles D. — Mass.
A.B. 1954, Boston College

Fetterolf, Wallace K. — Va.
A.B. 1950, The George Washington University

Feuer, Semi — D.C.
A.B. 1958, The George Washington University

Fichtner, Herman — Va.
A.B. 1950, Syracuse University
M.B.A. 1958, University of Pennsylvania

Fiergang, LeRoy — Pa.
A.B. 1958, Wilkes College

Filiatreau, Francis R., Jr. — N.Y.
B.C.E. 1957, Clarkson College of Technology

Finkel, Eugene J. — D.C.
A.B. 1952, Swarthmore College

Finkelstein, Jay M. — N.J.
B.S. in E.E. 1959, Drexel Institute of Technology

Finney, Charles N. — D.C.
A.B. in Govt. 1959, The George Washington University

Finnerud, Kenneth P. — Minn.
B.B.A. 1955, University of Minnesota

Fischer, Howard E. — N.Y.
A.B. 1960, Hunter College

Fischman, Richard H. — N.Y.
A.B. in Govt. 1961, The George Washington University

Fish, Paul W. — Md.
B.E.E 1959, Catholic University of America

Fishel, Gladys L. — Va.
A.B. 1954, A.M. 1956, The George Washington University

Fisher, Milton B., Jr. — Utah
A.M. 1961, Brigham Young University
Fladager, Dean A. — D.C.
B.S. 1955, Gonzaga University
Fleming, Clarence J. — Va.
B.S. in C.E. 1952, University of Illinois
Fleming, Edmund E. — Iowa
B.S. in F.S. 1959, Georgetown University
Fleming, Joe W. — Ark.
A.B. 1959, University of Arkansas
Flohr, Dean C. — Pa.
A.B. 1952, Dickinson College
Floyd, Elbert F. — Md.
B.S. 1949, University of Oregon
Flynn, Thomas W. — Va.
B.S. in C.E. 1956, University of South Carolina
Foltz, Jack L. — Ind.
B.S. 1957, Rose Polytechnic Institute
Fong, Harold — Hawaii
A.B. 1960, University of Southern California
Forester, John G. — N.C.
B.S. 1955, University of North Carolina
Forgy, Lawrence E. — Ky.
A.B. 1961, The George Washington University
Foster, Amy S. — D.C.
A.B. 1957, Long Island University
Foster, Lynn G. — Wash.
B.S. 1959, University of Michigan
Fournier, Arthur E., Jr. — Va.
B.E. 1957, Yale University
Fowles, J. F., Jr. — Va.
B.S. 1946, University of Idaho
LL.B. 1949, University of Utah
Fox, Jerome — N.Y.
A.B. 1953, Clark University
Frank, Kitty B. — D.C.
A.B. 1943, University of Wisconsin
Frazier, Henry B., III — Va.
A.B. 1956, University of Virginia
Freeman, Martin H. — Md.
A.B., B.S. in M.E. 1961, Lehigh University
Friedenson, Jay P. — Va.
A.B. 1956, Alfred University
Fullarton, David C. — Md.
B.S. 1961, University of Maryland
Fuller, Lawrence J. — Va.
J.D. 1951, University of Michigan
Futterer, Charles C. — Md.
A.B. 1959, University of Maryland

G

Gable, Raymond L. — Md.
B.E.E. 1960, Georgia Institute of Technology
Gall, Robert M. — Va.
B.C.E. 1960, The George Washington University
Gallagher, John E. — Md.
A.B. 1959, The George Washington University
Gallagher, Michael G. — Va.
A.B. in Govt. 1960, The George Washington University
Gamer, Janet G. — D.C.
A.B. 1960, Smith College
Garant, Ronald G. — N.H.
A.B. 1961, University of New Hampshire
Gardner, George F. — Del.
A.B. 1960, Dickinson College
Garner, Howard G. — Va.
B.S. 1956, Clemson Agricultural College
Garrett, Arthur S. — Pa.
B.Ch.E. 1959, Rensselear Polytechnic Institute
Gatewood, Herbert L. — Fla.
B.S. 1953, Rose Polytechnic Institute
Gaulin, Edward F. — D.C.
B.S. 1959, Georgetown University
Gealow, Jon C. — Ind.
B.S. in E.E. 1959, M.S. in E.E. 1960, University of Illinois
Geismar, Lee — D.C.
A.B. 1947, Hunter College
Gerstman, George H. — N.Y.
B.S. in E.E. 1960, University of Illinois
Giberga, Ovidio M. — Cuba
Doctor of Laws 1942, University of Havana
Gibson, Thomas J. — D.C.
B.E.E. 1956, Rensselaer Polytechnic Institute
Gild, Bernard — D.C.
B.B.A. 1957, University of Pittsburgh
Gill, Clifford G. — Va.
B.S. 1960, University of Maryland
Gillespie, Donald E. — Va.
B.S. 1955, Virginia Military Institute
Gillette, Galen G. — Va.
B.S. 1958, University of South Dakota
Glaser, Michael L. — D.C.
A.B. 1961, The George Washington University
Gleeson, Andrew T. — Md.
A.B. 1957, University of Maryland
Glover, Tom E. — Va.
A.B. 1932, Southwestern University
M.B.A. 1950, University of Texas
Godown, Richard D. — Pa.
A.B. 1955, Lafayette College
Goldberg, Harvey M. — Va.
A.B. 1958, Colgate University
LL.B. 1961, Columbia University
Goldberg, Robert L. — Mass.
B.S. 1959, Northeastern University
Goldhammer, Joel S. — Va.
B.S. in E.E. 1958, Carnegie Institute of Technology
Goldman, Ronald M. — D.C.
B.S. in E.E. 1961, Illinois Institute of Technology
Goldsborough, Nicholas — Md.
A.B. 1959, University of Virginia
Goldstein, Charles H. — Ohio
A.B. 1961, Western Reserve University
Goldstein, Martin E. — N.Y.
B.S. 1955, University of Illinois
Goldstein, Morton N. — D.C.
A.B. 1957, University of Maryland
Goldstein, Stephen H. — N.J.
A.B. 1960, American University
Golembe, Carter H. — Va.
A.B. 1946, A.M. 1947, Ph.D. 1952, Columbia University
Golob, Howard M. — N.Y.
B.B.A. 1958, Hofstra College
Goodson, Wallace G. — Idaho
B.S. 1961, Brigham Young University
Goody, Percy E. — D.C.
A.B. 1954, University of Maryland
Gose, Richard V. — Va.
B.S. in M.E. 1950, University of Wyoming
M.S. 1955, Northwestern University
Gralnek, Maurice N. — Ill.
A.B. 1958, University of Michigan
Granahan, Thomas F. — Fla.
A.B. 1960, Florida State University
Grasman, Gerald J. — Md.
A.B. 1958, Calvin College
Gratsias, Stylianos J. — D.C.
A.B. 1959, The George Washington University
Grauer, Richard D. — Mich.
B.S. 1958, University of Michigan
Graves, Donald W. — Va.
B.C.E. 1957, Cornell University
Grayson, Stephen — N.Y.
B.I.E. 1959, Georgia Institute of Technology

Greenlee, David A. Ohio
B.I.E. 1961, Georgia Institute of Technology

Green, Henry G. La.
A.B. 1958, Louisiana State University and Agricultural and Mechanical College

Greene, Nelson H. Md.
B.S. 1949, Carnegie Institute of Technology
M.S.E. 1956, John Hopkins University

Greene, Roosevelt B. D.C.
A.B. 1958, The George Washington University

Greenwald, Paul C. N.Y.
A.B. 1957, Lehigh University

Gregory, Gerald T. Va.
A.B. 1955, LL.B. 1958, St. John's University

Gregory, James P. Conn.
A.B. 1956, Brown University

Grossman, Joseph N.J.
A.B. in Govt. 1959, The George Washington University

Guerrieri, Harry J. D.C.
A.B. 1952. St. Vincent College

Gunod, Seymour D. Md.
A.B. 1949, The George Washington University

Guzman, Rafael Md.
A.B. University of Dayton

Gyllenhaal, Malcolm D. Ariz.
A.B. 1957, University of Arizona

H

Haas, Gaylord P., Jr. Va.
B.S. 1958, University of Notre Dame

Haase, Mark W. Ill.
A.B. 1960, Washington and Lee University

Haeussler, H. W. Va.
B.S. 1959, Bowling Green State University

Hagen, Gordon H. D.C.
A.B. 1957, St. Olaf College

Hagenlock, Raymond E. D.C.
A.B. 1957. Syracuse University

Haines, Dennis Ohio
B.S.C. 1959, Ohio University

Hale, Lester T. Md.
A.B. in Govt. 1957, The George Washington University

Hall, Alfred E. Mont.
B.S. 1956, Montana State College

Hall, Audrey D. Va.
A.B. 1958, The George Washington University

Hall, Charles S. Md.
A.B. 1930, McKendree College
LL.B. 1953, Wayne University

Hall, Henry L. Va.
A.B. 1953, University of Massachusetts

Hall, Jack H. Va.
B.Ch.E. 1957, Rensselaer Polytechnic Institute

Hall, John F. D.C.
B.S. 1959, Pennsylvania State University

Hallacher, Lester L. Pa.
B.S. 1959, Pennsylvania State University

Haller, Theodore R. Pa.
B.S. 1960, Pennsylvania State University

Halvorsen, Ronald M. Va.
B.S. in C.E. 1957, Drexel Institute of Technology

Hamburg, Charles B. N.Y.
B.Ch.E. 1960, Polytechnic Institute of Brooklyn

Hamel, Reginald S. N.C.
A.B. 1954, Duke University

Hamilton, Clyde H. S.C.
B.S. 1956, Wofford College

Hamilton, John C. Va.
A.B. 1954, Duke University

Hanaumi, Abraham A. Hawaii
A.B. 1958, University of Hawaii

Hanes, Grayson P. Va.
A.B. 1960, University of the South

Hanes, Thom F. Va.
A.B. 1958, Hampden-Sydney College

Hanna, Warren L. Colo.
A.B. 1955, Washintgon University

Hansen, David R. Iowa
A.B. 1960, Northwest Missouri State College

Harder, Paul R. Va.
B.S. in E.E. 1957, Rose Polytechnic Institute

Hardie, John A. Md.
A.B. 1956, The George Washington University

Hardman, John W. D.C.
B.S. 1952, University of Maryland

Harless, Roderick M. W.Va.
A.B. 1961, West Virginia State College

Harman, David B. Del.
A.B. 1961, Franklin and Marshall College

Harmer, John L. Utah
B.S. 1959, University of Utah

Harrell, Maurice E. Va.
B.S. in M.E. 1959, University of Alabama

Harrigan, Thomas J. Va.
A.B. in Govt. 1959, The George Washington University

Harrington, Robert C. Mass.
B.S. 1958, Boston College

Harris, David W. Colo.
A.B. 1958, University of Colorado
M.I.A. 1951, Columbia University

Harshman, Warren B D.C.
A.B. 1956, A.M. 1960, Harvard University

Hartel, Arthur P., Jr. N.C.
A.B. 1955, LL.B. 1958, Duke University

Harten, Glenn B. Md.
A.B. 1956, University of Maryland

Harvey, James E. Fla.
B.M.E. 1940, Tulane University
M.B.A. 1948, Harvard University

Haskell, Frank B., III Md.
A.B. 1960, Wake Forest College

Haug, John A. N.H.
B.S. 1955, University of New Hampshire

Haugen, Henry Wash.
B.S. 1955, U.S. Coast Guard Academy

Hause, Benton A. Va.
A.B. 1949, The George Washington University
M.B.A. 1955, University of Michigan

Hawes, George H. Nev.
B.S. 1959, University of Maine

Hawes, James E. D.C.
B.S. 1957, University of Illinois

Hawes, John D. Va.
B.S. 1957, University of California

Hayes, William K. Md.
B.S. 1952, Fordham College

Haynes, Harry J. Va.
M.D. 1938, The George Washington University

Healey, Patrick F. Md.
A.B. in Govt. 1959, The George Washington University

Heasley, Ross E. D.C.
A.B. in Govt. 1960, The George Washington University

Hecht, Irving M. Md.
B.B.A. 1947, College of the City of New York

Heeb, Louis F. Ind.
B.M.E. 1955, General Motors Institute

Hefter, Laurence R. Va.
B.M.E. 1957, Rensselaer Polytechnic Institute

Hegle, William E. D.C.
B.S. 1949, Georgetown University

Heller, Paul H. Md.
B.S. in C.E. 1960, Massachusetts Institute of Technology

Henderson, Daniel E., Jr. Texas
A.B. 1950, Trinity University
LL.B. 1950, University of Texas
Henderson, Douglas B. Pa.
B.S. 1957, Pennsylvania State University
Henderson, Sam G. Ga.
A.B. 1958, University of Alabama
Hendriksen, Leah K. D.C.
B.S. 1932, M.S. 1953, University of Michigan
A.M. 1936, Columbia University
Henry, Francis B. N.Y.
B.S. in M.E. 1958, University of South Carolina
Henson, William C. W.Va.
B.S. 1961, Morris Harvey College
Herink, LaVerne D. Md.
B.S. 1952, Iowa State College of Agriculture and Mechanic Arts
Hertz, Harvey S. Va.
B.S. 1955, University of Colorado
Hess, Robert W. D.C.
A.B. 1957, University of Michigan
Hill, James T. Md.
B.S. 1951, University of New Hampshire
Hill, Stephen P. Va.
A.B. 1957, Williams College
Himmel, Ira K. N.J.
B.S. 1960, Wilkes College
Hinds, William R. S.C.
B.M.E. 1956, Alabama Polytechnic Institute
Hinkle, James A. Va.
B.E.E. 1957, University of Virginia
Hinman, Gerald G. Md.
B.S. 1938, U.S. Naval Academy
Hirsch, Gladys E. Md.
A.B. 1940, Hunter College
Hirsch, Joseph I. Ohio
B.S. in C.E. 1961, Purdue University
Hittson, Charles H. Ohio
B.S. in M.E. 1960, Ohio University
Hobart, James D. Ohio
B.S. 1958, University of Illinois
Hobby, William M. N.C.
B.I.E. 1959, University of Florida
Hochberg, Philip R. Md.
B.S. 1961, Syracuse University
Hochhauser, Stanley M. N.Y.
A.B. 1958, Brooklyn College
Hochman, William N.J.
A.B. 1956, Indiana University
Hochwald, Fritz G. D.C.
Dipl.Ing. 1923, Techninische Hochschale zu Berlin, Germany
Hodgson, Albert C. Va.
B.S. 1957, Virginia Polytechnic Institute
Hoffman, Martin P. N.J.
B.S. in M.E. 1960, Newark College of Engineering
Holcomb, William S. Ill.
A.B. 1957, Illinois Wesleyan University
Holcombe, John H. Ill.
B.S. 1959, Iowa State Teachers College
Hollengreen, Jon F Pa.
B.S. 1959, University of Tennessee
Hollon, Dan S. Va.
A.B. 1949, American University
A.M. 1950, Columbia University
Holmes, Ralph A. Va.
B.S. 1947, University of Maryland
LL.B. 1950, University of Virginia
Holstrom, Robert W. Va.
LL.B. 1952, University of Miami
Holt, William H. D.C.
B.S. in Eng. 1957, The George Washington University
Honeycutt, Gary C. Ark.
B.S. 1954, University of Arkansas
Hopkins, Charles T. Idaho
A.B. 1960, Stanford University
Horgan, James J. Del.
B.S. 1957, LaSalle College
Horton, Corwin R. Oreg.
B.S. 1956, Oregon State College
Hovey, Harold A. Ohio
A.B. 1958, Wabash College
Howard, Jay W. D.C.
A.B. 1955, The George Washington University
Howard, Robert E. Ohio
B.S. in Ch.E. 1959, University of Cincinnati
Howells, William D. Maine
A.B. 1954, Harvard University
M.I.A. 1960, Columbia University
Hubbard, Robert R. Ohio
B.E.E. 1960, Ohio State University
Hubbel, Carter C. Md.
A.B. 1959, University of Maryland
Hudon, Edward G. D.C.
B.S. 1937, Bowdoin College
LL.B. 1947, LL.M. 1950, Georgetown University
M.S. in L.S. 1956, Catholic University of America
Hudson, Thomas L. Ohio
B.S. 1959, Ohio State University
Huff, Richard L. Va.
A.B. 1955, Lincoln University
Hughes, Peter L., III Md.
A.B. 1952, LL.B. 1958, Fordham University
Hughes, Richard D. Idaho
A.B. 1959, University of Idaho
Hulen, James R. Ill.
B.S. in M.E. 1958, University of Missouri
Humes, James C. Pa.
A.B. 1959, The George Washington University
Hummers, Edward W., Jr. Md.
B.S. 1958, Lehigh University
Humphreys, Robert R. Md.
A.B. 1959, University of Washington
Humphries, Nathaniel A. Va.
B.S. in M.E. 1956, University of South Carolina
B.S. in Met. 1958, University of Utah
Hundley, Charles C. Va.
B.S. 1959, Richmond Professional Institute
Hunter, Floyd D. Va.
B.S. 1961, U.S. Coast Guard Academy
Hunter, Thomas B. Va.
B.S. in C.E. 1956, Case Institute of Technology
Husting, Stephen S. Ill.
B.S. in M.E. 1954, Purdue University
Hyde, Herbert K., Jr. Mass.
A.B. 1955, University of Oklahoma

I

Isakov, Peter D.C.
Ch.E. 1958, University of Cincinnati

J

Jackson, John D. Va.
B.S. 1958, University of Maryland
Jackson, Richard K. D.C.
B.S. 1957, Iowa State College of Agriculture and Mechanic Arts
Jacobs, Kenneth E. W.Va.
B.S. 1956, University of California
Jacobs, Marvin E. Pa.
B.S. in Ch.E. 1959, Drexel Institute of Technology
Jacobsen, Bernice D.C.
B.E. 1937, Wisconsin State College
A.M. in Govt. 1954, The George Washington University
Jamborsky, Richard J. Va.
A.B. 1958, The George Washington University

Jastram, Harold D. S.C.
B.S. in E.E. 1957, South Dakota State College of Agriculture and Mechanic Arts
Jeffrey, Joseph D. Md.
B.S. 1957, University of Wisconsin
Jenkins, David M. Md.
A.B. 1958, Depauw University
Jenkins, John S. Va.
A.B. 1954, Lafayette College
Jenkins, John T. D.C.
A.B. 1960, Duke University
Jennings, Charles H., III Va.
A.B. 1951, University of Pittsburgh
M.S. 1952, University of Denver
Jennings, Richard M. Minn.
B.S. in E.E. 1960, Kansas State University of Agriculture and Applied Sciences
Jett, George W. Ky.
A.B. 1961, University of Kentucky
Johanningsmeier, Walter F. Ind.
B.S. 1956, Rose Polytechnic Institute
Johnson, Charles N. Calif.
A.B. 1956, Macalester College
Johnson, Charles W. Utah
A.B. 1955, Brigham Young University
Johnson, Daniel L. Md.
A.B. 1950, The George Washington University
Johnson, David W. Md.
B.S. 1952, Brooklyn College
Johnson, Frank W. N.J.
B.S. 1959, John Carroll University
Johnson, Irving M. D.C.
B.S. 1959, University of Washington
Johnson, Jonathan E. D.C.
B.Ch.E. 1959, M.B.A. 1960, Cornell University
Johnson, Mordecai S.C.
A.B. 1951, State Agricultural and Mechanical College, South Carolina
LL.B. 1959, Howard University
Johnson, Neil E. Ohio
B.S. 1959, Drake University
B.S. in I.E. 1960, Iowa State College
Johnson, Raymond C. Wis.
B.S. 1958, Wisconsin State College
Johnson, Raymond E. N.Y.
B.C.E. 1958, Rensselaer Polytechnic Institute
Johnson, Vernon W. Md.
A.B. 1956, Duke University
Johnson, William E. Mich.
B.Ch.E. 1960, University of Detroit
Johnston, Herbert R., Jr. N.Y.
A.B. 1959, Cornell University
Jolley, Joseph K. Idaho
A.B. 1960, The George Washington University
Jones, Charles S. D.C.
B.S. 1953, Duke University
Jones, David D. Pa.
A.B. 1958, Pennsylvania State University
Jones, Harry C. Va.
B.S. 1957, Yale University
Jones, William M. Texas
A.B. 1961, Texas Christian University
Jordan, Gary L. Kans.
B.S. in Ch.E. 1958, University of Kansas
Jordan, Phil W. Md.
B.S.C. 1935, University of Georgia
Jorgensen, Ralph G. Md.
A.B. 1960, The George Washington University
Josephson, Diana H. D.C.
A.B. 1958, Somerville College
Joyce, Kevin E. Va.
B.S. 1956, Worcester Polytechnic Institute
Juhasz, Andrew R. Md.
B.S. 1949, University of Buffalo
Jurecka, James R. Texas
A.B. 1957, Rice Institute

K

Kaiman, Carl S. Md.
B.S. in M.E. 1961, University of Nebraska
Kamp, Ronald C. Ill.
B.S. 1956, University of Illinois
Kaplan, Rae S. Texas
A.B. 1958, Rice Institute of Technology
Kapner, Lewis Fla.
A.B. 1958, University of Florida
Kareken, Ronald S Ill.
B.S. 1958, University of Illinois
Karsch, Stephen E. N.Y.
B.S. in B.A. 1961, American University
Kasten, Walter H. Ill.
Kastriner, Lawrence G. Va.
A.B. 1954, B.S. 1955, M.S. 1959, Columbia University
Katz, Laurence M. Fla.
Katz, Robert J. N.Y.
A.B. 1961, Brooklyn College
Katz, Sylvan L. D.C.
B.S. 1943, University of Maryland
Kauffman, Roscoe C. Pa.
B.S. 1958, Pennsylvania State University
Kaul, Donald A. Ohio
B.M.E. 1958, Ohio State University
Keehan, Michael B. Okla.
B.S. in Ch.E. 1957, University of New Mexico
Keiser, Clarence C. Md.
A.B. 1954, University of the South
Keller, Samuel W. D.C.
B.S. 1955, University of Maryland
Kelly, John F. Va.
A.B. 1958, Minnesota State Teachers College, Mankato
Kempf, Robert F. Va.
B.S. in E.E. 1952, University of Massachusetts
Kennedy, Harold F. Idaho
A.B. 1960, University of Idaho
Kenney, James A., III Md.
A.B. 1959, Dickinson College
Kenney, Joseph E. Va.
B.S. in M.E. 1956, University of Massachusetts
Kennington, Charles R., Jr. Va.
B.S. 1949, Kent State University
Kensinger, George L., Jr. Va.
B.E. 1959, Yale University
Kerr, Don M. Va.
B.S. in C.E. 1960, A.B. 1960, Texas Technological College
Kerr, John W., Jr. N.J.
B.B.A. 1960, College of William and Mary
Keshishian, Matthew M. Va.
A.B. 1961, University of Kentucky
Kesler, Vibert L., Jr. Va.
B.S. 1960, University of Utah
Ketcham, John T. Md.
A.B. in Govt. 1958, The George Washington University
Kiel, Frank W. Pa.
M.D. 1954, The George Washington University
Kieser, Henry S. D.C.
B.E. 1960, Yale University
Kim, John J. Wis.
B.S. 1959, D.C. Teachers College
Kindness, Gary S. Va.
B.S. in E.E. 1961, University of Wisconsin
King, George W. Ky.
B.S. in M.E. 1957, West Virginia University
King, James R. Ohio
B.S. 1960, University of Kentucky
Kinney, Robert G. Mass.
A.B. 1960, Ohio University
Kinville, Robert M.
B.S. 1958, Northeastern University

Kinzie, Robert W. — Md.
B.S. 1958, A.M. 1961, University of Maryland

Kirchman, Charles V. — Md.
A.B. 1959, University of Maryland

Kirkpatrick, Thomas H. — D.C.
B.S. 1958, University of Oregon

Klein, Melvin A. — N.Y.
B.S. 1956, U.S. Naval Academy

Klein, Zelda D. — D.C.
LL.B. 1934, National University Law School

Knechtel, Robert G. — D.C.
A.B. 1958, Cornell University

Kneipp, Robert F. — D.C.
A.B. 1935, Duke University

Knowles, Allen N. — Va.
B.S. in M.E. 1955, Iowa State College of Agriculture and Mechanic Arts

Knudson, James E. — Va.
A.B. 1960, Brigham Young University

Koch, John A. — D.C.
B.I.E. 1954, Ohio State University

Kodani, Roy M. — Hawaii
A.B. 1961, Lafayette College

Koeckert, Arthur H., Jr. — Ohio
B.S. 1957, Case Institute of Technology
M.S. 1959, Lehigh University

Koffsky, David N. — N.Y.
B.S. in E.E. 1956, Lafayette College

Kohn, Janet G. — D.C.
A.B. 1951, Antioch College

Kondo, Peter H. — Va.
B.S. 1957, Michigan College of Mining and Technology

Kondracki, Edward J. — N.J.
B.S. in E.E. 1959, Newark College of Engineering

Koth, Dean R. — Md.
A.B. 1958, University of Maryland

Kovac, Michael — Mo.
B.S. 1959, Washington University

Kovell, Stanley P. — Va.
B.S. in Ch.E. 1955, Northeastern University

Kovin, John F. — Md.
A.B. 1958, Washington Missionary College

Kraemer, John R. — Conn.
A.B. 1960, Georgetown University

Kratchman, Jack — Md.
B.S. 1948, College of the City of New York
M.S. 1953, New York University

Kraus, Charles K. — Md.
B.S. 1956, Georgetown University

Krause, Benjamin D. — Md.
B.S. 1959, University of Maryland

Krauss, Jerome F. — D.C.
A.B. 1958, Notre Dame University

Krawiec, Martin M. — N.Y.
B.S. 1958, Cornell University

Kreba, Henry C. — D.C.
A.B. in Govt. 1949, The George Washington University

Kregg, John — Va.
B.S. 1953, LL.B. 1958, Wayne State University

Kruger, Walter — D.C.
B.S. in M.E. 1956, Lafayette College

Krumme, Robert D. — Mo.
B.S. 1960, University of Nebraska

Kucharski, John M. — Wis.
B.E.E. 1958, Marquette University

Kud, Thaddeus J. — Alaska
Master of Laws 1933, Jagellonian University, Alaska

Kunitz, Norman N. — Pa.
B.S. in E.E. 1957, Drexel Institute of Technology

L

La Bonte, Clarence V. — Mass.
A.B. 1958, Cornell University

Labowski, Joseph — Pa.
B.S. 1956, Pennsylvania State University

LaBran, Ronald M. — Calif.
B.S. 1958, University of Pennsylvania

Lahr, Jack L. — Ill.
B.S. in M.E. 1956, University of Toledo

Laiche, Calvin J. — La.
B.S. 1954, Louisiana State University

Lake, Robert G. — D.C.
B.S. 1945, U.S. Military Academy
M.B.A. 1950, University of Chicago

Lakes, Cecil T. — Ohio
A.B. 1948, LL.B. 1950, University of Cincinnati

Lalli, Paul J. — Va.
A.B. 1952, College of the City of New York
A.M. 1953, Columbia University

Lamay, Joseph A. — N.J.
A.B. 1960, Pennsylvania State College

Lamb, Owen L. — N.Y.
B.E.E. 1956, Rensselaer Polytechnic Institute

Lamb, Roberta — Iowa
A.B. 1957, Simpson College
A.M. 1960, American University

Lambe, James M. — Mont.
A.B. 1959, Montana State University

Lampe, Thomas R. — Iowa
B.S. in I.E. 1959, Iowa State University of Science and Technology

Lamphere, George E. — D.C.
B.S. 1952, Haverford College
B.S. 1954, Massachusetts Institute of Technology

Landesman, Charles H. — N.J.
B.S. 1960, Rutgers University

Lane, Anthony T. — Va.
B.E.E. 1957, The George Washington University

Lane, Helen S. — Va.
A.B. 1928, University of Michigan

Lang, William A. — Va.
A.B. in Govt. 1954, The George Washington University

Langston, Jay C. — D.C.
B.S. 1957, Montana State College

Larsen, Kent W. — Utah
A.B. 1960, University of Utah

Latimer, Edwin P. — D.C.
B.S. 1959, University of Maryland

Latshaw, Betty J. — Okla.
B.B.A. 1959, University of Oklahoma

Lawson, William S. — Va.
B.S. 1957, Michigan State University of Agriculture and Applied Science

Leatherman, Stanley J. — Ind.
A.B. 1957, Taylor University

Leavitt, Alfred L. — Oreg.
B.S. in Ch.E. 1957, Oregon State College

Lee, Linda K. — Conn.
A.B. 1961, Smith College

Leiner, Charles P. — Md.
B.S. 1951, San Diego State College

Leitner, Saul — N.Y.
B.M.E. 1959, Polytechnic Institute of Brooklyn

Lemert, James E. — Ohio
B.S. in E.E. 1957, Purdue University

Lenkin, Ronald L. — D.C.
A.B. 1959, The George Washington University

Leppink, James A. — Va.
B.S. 1957, University of Wyoming

Lerch, Harry W. — Md.
A.B. 1959, Wesleyan University

Leslie, David E. — Calif.
B.S. 1957, California State Polytechnic College

Levin, Stanley — Md.
A.B. 1949, Yeshiva University

Levine, Morton H. — N.Y.
B.S. 1960, American University

Levison, Floyd S. — Va.
B.S. 1957, U.S. Merchant Marine Academy

Levitz, Saylor L. — Pa.
B.S. 1956, Pennsylvania State University

Levy, Earl — Va.
B.E.E. 1952, Rensselaer Polytechnic Institute

Lewis, Ancel W., Jr. — D.C.
B.S. 1959, South Dakota School of Mines

Lewis, Eric K. — Md.
A.B. 1955, University of Rochester

Lewis, Edward G. — Va.
B.S. 1956, Michigan College of Mining and Technology

Lewis, Samuel H. — Del.
A.B. 1959, Cornell University

Liberman, Arthur L. — N.J.
A.B. 1955, M.S. 1957, Columbia University

Liegel, Robert G. — N.Y.
B.S. 1955, Syracuse University

Lilly, David G. — W.Va.
A.B. 1960, University of California at Los Angeles

Lindrooth, Charles H. — Ill.
B.S. 1956, University of Illinois

Lineberry, Robert G. — Va.
B.B.A. 1961, The George Washington University

Litton, Randall G. — Idaho
B.S. in E.E. 1961, University of Idaho

Llewellyn, James M., Jr. — Ark.
B.S. in A.E. 1956, St. Louis University

Lochte, Albert J. — Va.
B.S. 1957, University of Maryland

Loepp, Marie T. — D.C.
A.B. 1951, State University of Iowa

Long, Stefan C. — Va.
A.B. 1960, Roanoke College

Lotz, William E. — Md.
B.S. 1947, A.M. 1949, University of Oregon
Ph.D. 1957, University of Tennessee

Lourie, Leonard L. — Md.
A.B. 1942, Miami University

Love, James W. — Va.
B.A.E. 1950, Catholic University of America

Lubitz, Stuart — Fla.
B.I.E. 1957, B.M.E. 1958, University of Florida

Lucero, Carlos F. — Colo.
A.B. 1961, Adams State College

Lukasik, Frank A. — N.Y.
B.S. 1958, Rhode Island School of Design

Lynch, Robert E. — D.C.
A.B. 1956, University of Maryland

Lyne, Robert C. — Va.
B.S. 1958, North Carolina State College

Lyons, John C. — Va.
A.B. 1956, University of Rhode Island

Lyons, Joseph S. — D.C.
B.S. 1958, Mississippi Southern College

M

MacAdam, Daniel B. — D.C.
B.S. 1957, State Teachers College at Boston

MacDonald, Roderick W. — Va.
M.E. 1959, Colorado School of Mines

Mackiewicz, John J. — D.C.
B.Ch.E. 1957, Yale University

Madden, Richard L. — Ind.
B.S. 1956, Indiana University

Madigan, Robert J. — D.C.
B.S. 1960, The George Washington University

Madsen, Lowell L. — Utah
B.S. 1954, Brigham Young University

Magnuson, Robert L. — Idaho
B.S. in B.A. 1960, University of Idaho

Maher, Robert E. — D.C.
A.B. 1954, St. Mary's University

Main, Philip D. — Conn.
A.B. 1958, Bates College

Maki, Allan O. — Wis.
B.S. in Ch.E. 1959, University of Wisconsin

Makris, James L. — N.H.
B.S. 1958, University of New Hampshire

Malone, John D. — D.C.
B.M.E. 1956, Cornell University

Manatt, Charles T. — Iowa
B.S. 1958, Iowa State College of Agriculture and Mechanic Arts

Manning, John R. — Iowa
B.S. in Eng. 1957, The George Washington University

Marin, Louis — N.Y.
B.B.A. 1957, College of the City of New York
M.B.A. 1959, Cornell University

Marinaccio, Charles L. — Conn.
A.B. 1957, University of Connecticut

Marjama, Owen D. — Va.
B.S. in Met.E. 1958, Michigan College of Mining and Technology
M.S. in Met.E. 1961, Wayne State University

Marlo, George J. — Md.
B.S. 1956, Pennsylvania State University

Marlowe, Freddie — Texas
A.B. 1961, B.S. 1961, Agricultural and Mechanical College of Texas

Marmer, Melvin E. — Md.
B.S. 1955, M.B.A. 1957, University of Maryland

Marquardt, Merritt R. — Wis.
B.S. 1956, University of Wisconsin

Marrero, Robert — Va.
A.B. 1958, The George Washington University

Marritz, Robert O. — N.J.
A.B. 1960, B.S. in E.E. 1961, University of Pennsylvania

Marsh, Luther A. — Va.
A.B. 1951, University of North Carolina

Martens, Don W. — Va.
B.S. 1957, University of Wisconsin

Martin, John C., Jr. — Pa.
A.B. 1960, University of Delaware

Martine, Chester E., Jr. — Va.
B.M.E. 1958, Rensselaer Polytechnic Institute

Martinez, Juan — Mexico
Law Cert. University of Guadalajara

Mason, Ralph A., Jr. — Ala.
B.S. 1961, Centenary College

Massengill, Roy H. — N.C.
B.S. 1959, North Carolina State Teachers College

Matthews, Marvin F. — Texas
A.B. 1957, University of Rochester
LL.B. 1960, American University

Matzureff, George D. — Ill.
A.B. 1954, University of Illinois
A.M. 1957, Harvard University

Mautz, George F. — Pa.
B.C.E. 1957, Villanova University

Mays, Charles A. — Md.
A.B. 1961, The George Washington University

McAvoy, Thomas J. — N.Y.
A.B. 1953, Niagara University

McBay, Wilbur L. — Mo.
B.S. in M.E. 1960, University of Missouri

McCarthy, James F. — D.C.
A.B. 1956, Boston University

McClafferty, Lawrence B. — Md.
A.B. 1957, Muhlenberg College

McClelland, Charles I. — Va.
B.S. 1955, Virginia Military Institute

McConnell, Daniel E. — N.C.
B.S. in M.E. 1960, Duke University

McCormack, John J. — Md.
B.S. 1954, Boston College

McCormick, James C. — Ariz.
A.B. 1958, University of Arizona

McCulley, William L. — Va.
B.S. 1949, Bowling Green University

McDermott, Edwin F. — Ohio
A.B. 1951, Denison University
McDonnell, Robert J. — Pa.
B.S. 1958, Drexel Institute of Technology
McDowell, William W., Jr. — Md.
B.S. 1953, Johns Hopkins University
McElhaney, Matthew K. — Va.
A.B. 1954, Thiel College
McElvain, Warren L. — Colo.
A.B. 1961, University of Colorado
McFarland, Wallace B. — Md.
A.B. 1942, Yale University
McGehee, Travis S. — Md.
B.S. 1956, Texas College of Arts and Industries
McGhehey, Marion A. — Va.
B.S. 1945, Central Normal College
M.S. 1947, Butler University
Ed.D. 1953, Indiana University
McGill, Lawrence H. — D.C.
A.B. 1950, American University
A.M. 1959, Georgetown University
McGuckian, Paul A. — Md.
A.B. 1960, Dickinson College
McGuire, Thomas A. — Mich.
B.S.S. 1959, Loyola University
McKechnie, Elmer J. — Pa.
A.B. 1960, Gettysburg College
McKelvie, Eleanor R. — D.C.
A.B. 1957, Ursinus College
McKenna, James O. — Va.
A.B. 1957, Creighton University
A.M 1961, The George Washington University
McKenzie, Michael E. — Va.
A.B. 1959, Dartmouth College
McLear, Robert L. — Ill.
B.S. 1959, University of Arizona
McNeely, Henry E. — Mich.
A.B. 1935, Wayne University
McTernan, George T., Jr. — Ill.
A.B. 1959, University of Notre Dame
Mead, Harry L. Jr. — Va.
A.B. 1955, LL.B. 1958, Harvard University
Means, Cecil P. — Va.
A.B. 1957, University of Nebraska
Means, Robert C. — Iowa
B.S. 1960, Iowa State College of Agriculture and Mechanic Arts
Mele, Angelo J. — Va.
B.Marine Eng. 1958, State University of New York
Meller, Michael N. — Va.
B.Ch.E. 1957, Pratt Institute
Mennen, Joseph — Ga.
B.S. 1961, University of Georgia
Mennis, Jack R. — D.C.
B.B.A. 1960, College of the City of New York
Mentis, George A. — Md.
B.S. 1947, Loyola University
Merkel, David R. — Wis.
B.S. 1959, University of Wisconsin
Meros, Edward J. — Pa.
B.S. 1953, Pennsylvania State University
Mervine, Lewis R. — Md.
B.S. 1955, Pennsylvania State Teachers College, Bloomsburg
Messenger, Harold W. — Okla.
B.B.A. 1957, University of Oklahoma
Metzger, Donald L. — Md.
B.S. in E.E. 1958, University of Pittsburgh
Meyers, Albert T. — Md.
B.S. 1951, University of Maryland
Meyers, Bruce F. — Va.
B.S. 1948, University of Washington
Michaels, Stanley — N.Y.
A.B. 1959, Cornell University
Michels, Francis B. — Calif.
B.S. 1958, Oregon State College
Mikesell, William A. — Va.
B.S. 1954, Pennsylvania State University
Miles, Tim R. — Tenn.
B.S.E. 1959, Vanderbilt University
Miller, Harold O. — Pa.
A.B. 1960, Lebanon Valley College
Miller, John T. — Tenn.
A.B. 1957, East Tennessee State College
Miller, Lawrence O. — N.J.
B.S. 1954, University of Maryland
Miller, Stanley R. — Kans.
B.S. in M.E. 1961, B.S. in B.A. 1961, Kansas State University of Agriculture and Applied Science
Miller, Stephen — Mass.
A.B. 1959, Michigan State University of Agriculture and Applied Science
Miller, William T. — Texas
B.B.A. 1939, Univeristy of Texas
Milstead, Jerry B. — Va.
B.S. in E.E. 1957, Virginia Polytechnic Institute
Mish, Joseph J. — N.Y.
B.S. 1960, University of Maryland
Mitchell, Americus — D.C.
A.B. 1945, Vanderbilt University
LL.B. 1955, The George Washington University
Molitch, Matthew — Md.
B.S. 1957, New York University
Monahan, Thomas H. — Va.
B.S. 1956, Richmond Professional Institute
Montgomery, Larry D. — Kans.
A.B. 1960, Southwestern College
Moody, Clifford J. — Va.
A.B. 1958, University of New Hampshire
Mooers, Donald L. — Maine
A.B. 1960, University of Maine
Moore, Malcolm L. — Minn.
B.S. in M.E. 1953, Purdue University
Moore, Robert E. — S.D.
B.S. in B.A. 1958, University of South Dakota
Moran, Andrew J. — Va.
A.B. 1953, St. John's College
Moran, Winnifred M. — N.H.
B.S. 1940, University of New Hampshire
Mordkofsky, Harold — Md.
B.E.E. 1958, College of the City of New York
Morenoff, Jerome — D.C.
A.B. 1958, B.S. 1959, M.S. 1960, Columbia University
Moring, John F. — Va.
B.S. in I.E. 1957, Virginia Polytechnic Institute
Morris, Murrell P. — Va.
B.S. 1934, M.S. 1936, Louisiana College
Ph.D. 1949, Louisiana State University
Morris, Ronald D. — N.Y.
B.S. 1955, University of Tennessee
Morrison, Robert L. — Md.
B.S. 1956, Agricultural and Technical College of North Carolina
Mossinghoff, Gerald J. — D.C.
B.S. 1957, St. Louis University
Motsko, Donald R. — Va.
B.S. 1957, Pennsylvania State University
Mulholland, John H. — Ill.
B.S. 1957, University of Illinois
Mullins, Dennis P. — W.Va.
A.B. 1959, Columbia University
Mullins, George G. — Va.
A.B. 1945, Hamline University
Mullins, John J., Jr. — Mass.
B.S.E. 1956, University of Connecticut
Multer, Richard D. — Colo.
B.S. in M.E. 1956, University of Colorado
Munnis, David V. — Ill.
B.S. 1959, University of Illinois
Munro, Sanford S. — Wash.
A.B. 1957, The George Washington University

Munter, Theodore A. D.C.
A.B. 1954, Bucknell University
LL.B. 1958, The George Washington University
Murphy, Arthur A. Mass.
B.S. 1946, U.S. Military Academy
LL.B. 1952, Harvard University
Murphy, Edward D. N.Y.
B.S. 1959, University of Notre Dame
Murphy, Joseph P. Va.
A.B. 1949, LL.B. 1950, LL.M. 1952, The George Washington University
Murray, James G. Va.
B.S. in M.E. 1948, University of Maryland
B.E.E. 1956, The George Washington University
Musumeci, Alfred V. N.Y.
B.M.E. 1956, Rensselaer Polytechnic Institute

N

Naddeo, Nathan J. Md.
A.B. in Govt. 1956, The George Washington University
Nagel, Warren T. D.C.
B.S. 1961, American University
Nash, John B. Va.
A.B. 1935, University of Utah
Natalie, Ronald B. D.C.
A.B. 1957, Tufts University
Nateman, Gary M. Ohio
B.S.C. 1959, Ohio University
Needham, Patricia A. D.C.
A.B. 1959, St. Mary-of-the-Woods College
Neilan, George J. N.J.
B.E. 1957, Yale University
Nelson, Julia N. Va.
A.B. 1944, University of California
Nettles, James A. S.C.
B.S. 1960, Clemson Agricultural College
Newland, Danny A. Fla.
A.B. 1960, College of William and Mary
Ney, Wilbert R. Va.
B.S. 1957, Yale University
Nichols, Charles R. N.M.
A.B. 1958, University of New Mexico
Nielson, Norman J. Utah
B.S. 1958, University of Utah
Niles, Robert A. Colo.
Nimeroff, Bertram D.C.
B.E.E. 1942, College of the City of New York
Nixon, William L. Va.
B.S. 1958, Brigham Young University
Noll, William B. Va.
B.Met.E. 1959, Ohio State University
Norcross, George E. Mich.
B.S. in F.S. 1961, Georgetown University
Nordstrom, John R. N.D.
A.B. 1949, Minnesota State Teachers College, Moorhead
Norell, Julia J. Ark.
A.B. 1957, Ohio Wesleyan University
Novosad, Stephen J. Va.
B.S. 1953, Texas Agricultural and Mechanical College
Nypaver, Edward W. Pa.
B.S. 1957, University of Pittsburgh

O

O'Connor, Dennis E. Hawaii
B.S. 1952, U.S. Naval Academy
O'Connor, Edward D. Ohio
B.S. in M.E. 1961, University of Notre Dame
O'Connor, Richard T. N.J.
A.B. 1956, New Jersey State Teachers College, Montclair
O'Donnell, Garland W. Md.
A.B. 1959, The George Washington University
Oeffner, Frederick C. Iowa
B.S. 1959, Iowa State College of Agriculture and Mechanic Arts
Olds, Bettye A. D.C.
A.B. 1960, Anderson College
Olender, Jack H. Pa.
A.B. 1957, LL.B. 1960, University of Pittsburgh
Oliver, Robert S. Texas
A.B. 1960, Texas Christian University
Olson, Gordon H. Va.
B.S. 1955, North Dakota Agricultural College
O'Neill, James G. Mass.
B.S. in M.E. 1960, Northeastern University
Opack, Edward H. D.C.
A.B. 1961, The George Washington University
Opdyke, Robert D. Md.
A.B. 1957, Western Michigan University
O'Rourke, Francis J. Mass.
B.S. 1955, Northeastern University
O'Rourke, Thomas W. Ill.
B.S. in Ch.E. 1959, Purdue University
Ortiz, Silvestre E. Panama Canal Zone
B.C.S. 1958, Louisiana State University and Agricultural and Mechanical College
Osburn, John A. Utah
B.S. 1957, Brigham Young University
Oswald, Robert L. Md.
A.B. 1960, University of Maryland
O'Toole, Ursula E. D.C.
B.S. 1954, Loyola University
Otto, Donald L. Iowa
B.S. in M.E. 1959, Iowa State College of Agriculture and Mechanic Arts

P

Park, Keh S. Mass.
A.B. 1959, Alfred University
Parker, Sheldon H. Va.
B.Ch.E. 1957, College of the City of New York
Parker, Walter W., III Va.
B.S. 1957, University of South Carolina
Parks, Norman S. Pa.
A.B. 1955, Transylvania College
A.M. 1956, Syracuse University
Parlante, Joseph L. N.Y.
B.S. in F.S. 1957, Georgetown University
Partee, Woodie A. D.C.
A.B. 1943, University of Georgia
Pascal, Paul L. Md.
A.B. 1961, University of Maryland
Pasternak, Noel A. Md.
A.B. 1958, Colgate University
M.B.A. 1959, Columbia University
Paterson, James Mich.
A.B. 1958, University of Michigan
Pattillo, James L. Utah
A.B. 1950, North Texas State College
Patton, Harold R. Ill.
B.S. in E.E. 1960, Washington University
Paul, Alan G. Va.
B.M.E. 1956, Rensselaer Polytechnic Institute
Peery, Kenneth E. Va.
A.B. 1947, Kansas State Teachers College, Emporia
LL.B. 1950, University of Kansas
LL.M. 1959, The George Washington University
Peltin, Sherwin C. Wis.
B.B.A. 1950, LL.B. 1952, University of Wisconsin
LL.M. 1955, New York University
Peltzer, Verona A. Va.
A.B. 1941, Depauw University
Peng, Chiping La.
Graduate 1942, Central Institute of Political Science

Perkins, Robert S. Fla.
A.B. 1960, University of Florida
Perko, Robert R. Va.
B.S. in F.S. 1950, Georgetown University
Perlman, Alan M. D.C.
A.B. 1960, The George Washington University
Peterson, Bennett P. Utah
B.S. 1959, University of Utah
Peterson, Gordon L. Md.
B.S. 1959, University of Wisconsin
Peterson, Kevin R. Va.
B.S. 1953, Canisius College
Peterson, Robert F. Idaho
A.B. 1954, University of Idaho
Peterson, Thomas L. Va.
B.S. 1957, Stanford University
Petkoff, Leonard Calif.
A.B. 1938, LL.B. 1940, New York University
Pezzner, Harold Pa.
B.S. 1958, Pennsylvania State University
Phelps, Thomas D. Iowa
B.S. 1959, Iowa State University of Science and Technology
Phillips, Gabriel Pa.
B.S. 1956, University of Maryland
Phillips, Ronald L. Mo.
B.S. 1958, M.S. 1959, University of Kansas
Piazza, Maria L. Mass.
B.S. in E.E. 1960, Northeastern University
Pierson, William T., Jr. D.C.
A.B. 1961, Cornell University
Pinckney, Francis M. Va.
B.S. 1957, University of South Carolina
Pincus, Sheldon M. Md.
A.B. 1961, University of Maryland
Pinkstaff, Robert S. N.Y.
B.S. in Ch.E. 1959, Iowa State College of Agriculture and Mechanic Arts
Pitts, James H. D.C.
B.S. 1960, University of Maryland
Pitts, Mildred E. Md.
A.B. 1953, Syracuse University
Platt, Michael T. Va.
B.E.E. 1957, Rensselaer Polytechnic Institute
Plumley, Allan R. Va.
A.B. in Govt. 1959, The George Washington University
Pohoryles, Louis N.Y.
B.B.A. 1959, College of the City of New York
Pollack, David Va.
B.S. in A.E. 1956, University of Miami
Pollack, Morris I. Va.
B.S. in M.E. 1954, Newark College of Engineering
Polsby, Allen I. Md.
A.B. 1959, Brown University
Pompan, Jacob B. N.Y.
B.S. 1948, U.S. Military Academy
Pont, James K. Va.
A.B. 1960, Nebraska Wesleyan University
Porter, Parnell J. Va.
A.B. 1958, University of Pittsburgh
Posta, John J. Pa.
B.S. in Eng. 1957, The George Washington University
Potter, Holbrook L. Va.
A.B. in Govt. 1951, The George Washington University
Potter, Lawrence M. Mich.
A.B. 1960, Michigan State University of Agriculture and Applied Science
Pournaras, Stephen W. Va.
A.B. 1942, Brown University
M.S. 1951, New York University
Powers, George R. Va.
B.S. 1957, University of Illinois
Powers, Thomas P. D.C.
A.B. 1959, University of Buffalo
Pratt, Stanley R., III Mich.
A.B. 1961, Hillsdale College
Preis, Marvin E. D.C.
B.S. 1958, University of Pennsylvania
Pressman, David R. Pa.
B.S. 1959, Pennsylvania State University
Preston, Kenneth G. Ohio
B.I.E. 1959, Ohio State University
Prestwich, John P. Md.
B.S. in Com. 1947, University of Notre Dame
Price, Robert L. D.C.
B.S. 1959, Morris Harvey College
Price, Robert M. S.C.
A.B. 1959, University of South Carolina
Priddy, Robert R. D.C.
B.S. 1958, Principia College
Profeta, Samuel J. N.Y.
A.B. 1957, University of Buffalo
Pyles, Warren S. Va.
B.S. in E.E. 1957, Carnegie Institute of Technology

Q

Quenon, Robert H. W.Va.
B.S. in E.M. 1957, West Virginia University
Quinn, Thomas A. D.C.
B.S. 1959, Brigham Young University
Quist, Gordon J. Mich.
A.B. 1959, Michigan State University of Agriculture and Applied Science

R

Rabinowitz, Jerry N.Y.
A.B. 1958, West Virginia Wesleyan College
Rabuse, John R. N.J.
B.S. 1960, Fordham University
Ramik, Vincent L. Pa.
B.S. 1957, Pennsylvania State University
Randa, John C. Wis.
B.E.E. 1957, Marquette University
Rapp, Rudyard K. Mo.
B.S. in I.E. 1957, Washington University
Rarden, Michael A Idaho
B.S. 1961, Idaho State College
Rawding, George T. N.J.
B.B.A. 1958, Upsala College
Ray, Warren E. D.C.
B.S. in E.E. 1952, M.S. 1956, University of Oklahoma
Reade, Arthur I., Jr. Mass.
A.B. 1959, Harvard University
Reagin, Ronald W. Va.
B.S. 1958, University of Missouri
Reams, Radford M., III Calif.
B.E. 1957, Vanderbilt University
Record, Richard F. Ill.
B.S. 1959, Georgetown University
Reep, John O. N.D.
B.S. in I.E. 1957, University of North Dakota
Reeser, Ralph R. Md.
A.B. 1955, University of Washington
Reeves, Alvin C. Md.
A.B. 1952, University of Maryland
Reid, Harry M. Utah
B.S. 1961, Utah State University of Agriculture and Applied Science
Rendall, Roy C. D.C.
A.B. 1957, Concordia College
Renner, Joseph N. D.C.
B.S. 1935, University of Oregon
Reuben, Jesse Va.
A.B. 1958, The George Washington University
Reyback, James M. Md.
B.S. 1943, U.S. Naval Academy
Reynolds, William C. Pa.
B.S. 1957, Swarthmore College

Rice, Bennie E. Ark.
A.B. 1959, University of Arkansas
Rice, John D. Utah
B.S. 1958, Utah State University of Agriculture and Applied Science
Richardson, Gordon A. D.C.
B.S. 1958, The George Washington University
Richie, David A. Va.
A.B. 1958, Haverford College
Ridgill, James L., Jr. Va.
LL.B. 1960, Southern Methodist University
Riggins, Wayland H. Va.
B.S. 1956, Clemson Agricultural College
Riggs, John T. Pa.
A.B. 1956, Pennsylvania State University
Rigler, Douglas V. Md.
B.S. 1956, U.S. Naval Academy
Risoff, Stefan D.C.
LL.D. 1945, University of Heidelberg, Germany
Roberts, Charles F. Wash.
A.B. 1957, State College of Washington
Roberts, Leslie A. Texas
A.B. 1958, University of Texas
Roberts, Sue A. D.C.
A.B. 1960, The George Washington University
Robinson, Jack W. D.C.
B.S. 1955, University of Tennessee
Robinson, Paul R. Nebr.
A.B. 1959, University of Wyoming
Rockman, Howard B. Md.
B.S. in M.E. 1959, Drexel Institute of Technology
Roen, Stephen A. N.Y.
E.E. 1958, University of Cincinnati
Roetman, Orvil M. Oreg.
A.B. 1950, University of Minnesota
B.S. 1955, U.S. Navy Postgraduate School
Rogers, Bobby W. N.C.
B.S. 1959, North Carolina State College
Roher, Joseph N.Y.
B.M.E. 1957, Rensselaer Polytechnic Institute
Rollinson, Mark Va.
A.B. 1958, Duke University
Rose, Jenny K. N.Y.
A.B. 1958, Hood College
Rosenthal, Arnold Va.
B.S. in C.E. 1953, Wayne State University
Rosenstein, Irwin B. Conn.
B.S. 1958, University of Pennsylvania
Rosipal, Arlene M. Pa.
A.B. 1961, Pennsylvania State University
Rothberg, Harvey J. N.Y.
B.S. in B.A. 1961, University of Buffalo
Rowland, Bertram I. Calif.
B.S. 1950, University of California
Ph.D. 1954, University of Washington
Rowland, Roger D. La.
B.S. in Ch.E., A.B. 1956, University of Texas
Rubin, Lonnie B. Md.
B.S. 1954, University of Maryland
Rubin, Rose Pa.
Ruddy, Robert E. S.D.
A.B. 1961, State University of South Dakota
Rudge, Howard J. Va.
A.B. 1958, Bucknell University
Ruffner, Ernest L. Va.
B.S. 1956, U.S. Military Academy
Ruppert, Thomas O. Va.
A.B. in Govt. 1957, The George Washington University
Rusis, Robert H. Md.
A.B. 1956, The George Washington University
Rynerson, Wendell P. Ind.
A.B. 1926, DePauw University
LL.B. 1929, Indiana University
Rytlewski, Francis L. D.C.
B.S. 1953, Montana School of Mines

S

Sabatine, Paul L. Md.
B.S. 1950, Georgetown University
Sachs, Daniel N.Y.
B.S. 1955, Cornell University
Safford, Donald S. Va.
A.B. 1955, Colgate University
Sakayan, Harold A. D.C.
B.S. 1957, University of Maryland
Salzberg, Charles Va.
A.B. in Govt. 1960, The George Washington University
Sammon, Daniel J. D.C.
B.S. 1957, Case Institute of Technology
LL.B. 1960, Georgetown University
Sandell, Charles W. Wash.
A.B. 1958, University of Washington
Sanders, John F. Va.
A.B. 1960, University of Tennessee
Sanner, Jay W. Md.
B.S. 1958, College of William and Mary
Sanner, Paul J. Va.
A.B. 1961, Georgetown University
Sather, Arvid A. Wis.
A.B. 1954, University of Minnesota
Scanlan, Richard J. Va.
B.S. in M.E. 1952, Michigan College of Mining and Technology
Scheer, Edward E. Va.
Doctor of Law 1931, Pazmany Peter University, Hungary
Schiller, Samuel I. D.C.
A.B. 1952, Rice Institute
Schmalz, Richard L. W.Va.
A.B. 1957, Centre College of Kentucky
Schmid, Otto, Jr. Tenn.
B.E.E. 1953, Georgia Institute of Technology
Schneiberg, Harold S. D.C.
A.B. in Govt. 1957, The George Washington University
Schnell, William N. Ill.
A.B. 1958, University of Illinois
Schornhorst, Frederick T. Iowa
A.B. 1956, Iowa State University of Science and Technology
Schucker, Robert M. D.C.
B.S. 1953, U.S. Naval Academy
Schuetz, William A. Pa.
B.S. in M.E. 1959, Drexel Institute of Technology
Schultz, James C. Nebr.
B.S. 1956, University of Nebraska
Schultz, James G. Kans.
A.B. 1958, University of Kansas
Schurman, Charles E. D.C.
B.S. 1950, U.S. Merchant Marine Academy
B.S. 1951, University of California
Schwartz, Abraham N. Va.
LL.B. 1924, The George Washington University
Schwartz, Arthur Nebr.
B.S. in I.E. 1958, Iowa State College of Agriculture and Mechanic Arts
Schwartz, Charles H. Pa.
B.S. in E.E. 1957, Drexel Institute of Technology
Schwartz, Howard S. Va.
B.B.A. 1959, University of Miami
Schwarz, Carl W. Wis.
B.C.E. 1958, Cornell University
Sciascia, Richard S. Pa.
B.S. in E.E. 1949, Lafayette College
Scott, William A. D.C.
A.B. 1958, Johns Hopkins University
Seas, Robert J. N.Y.
B.S. in E.E. 1954, Carnegie Institute of Technology

Segelke, Vern W. — Colo.
B.S. in C.E. 1955, Colorado State University

Seideman, Richard R. — N.J.
A.B. 1955, Pennsylvania State University

Seiler, Donald W. — Va.
A.B. 1956, College of William and Mary

Seiler, Jerry R. — Ariz.
B.S. 1957, University of Arizona

Seitchik, Jay L. — Pa.
B.S. in M.E. 1961, Drexel Institute of Technology

Selman, Leonard S. — N.Y.
B.S. 1958, University of Connecticut

Senter, Jacob — La.
A.B. 1958, University of Alabama

Shagam, Edwin M. — Md.
B.S. in E.E. 1948, University of Pittsburgh
LL.B. 1959, University of Maryland

Shampain, Leon — D.C.
A.B. 1949, The George Washington University
LL.B. 1951, University of Miami

Shapiro, Charles E. — Md.
B.S. 1960, University of Maryland

Sharp, Melvin — Pa.
B.S. in E.E. 1957, Drexel Institute of Technology

Shaw, Clinton R. — Mass.
A.B. 1959, University of Massachusetts

Shea, Andrew J. — D.C.
A.B. 1960, College of Saint Thomas

Shealy, Joseph H. — Md.
A.B. 1961, Duke University

Sheets, James R. — Md.
A.B. 1955, State College of Washington

Shepherd, Edward A. — Md.
B.S. 1960, University of Maryland

Shepherd, John T. — Va.
B.S. 1942, U.S. Naval Academy
M.S. 1950, California State Polytechnic College

Sherk, Kenneth J. — Iowa
B.S. 1955, State University of Iowa

Sherling, Fred W. — D.C.
B.S. in Ch.E. 1957, University of Tennessee

Sherman, Edward L. — Md.
A.B. 1951, A.M. 1953, Roosevelt University

Sherman, Russell E. — N.C.
A.B. 1958, Duke University

Shifflett, Ernest R. — Va.
A.B. 1957, The George Washington University

Shrinsky, Jason L. — Pa.
A.B. 1959, University of Pittsburgh

Siegemund, Ralf — Va.
Diploma Geophysiker 1950, University of Berlin, Germany

Siemens, James B. — Okla.
A.B. 1957, St. John's College

Siemens, John E., Jr. — R.I.
A.B. 1956, St. John's College

Silber, Richard J. — Pa.
A.B. 1959, Dickinson College

Silverstein, M. H. — Mass.
B.S. 1959, Northeastern University

Singer, Donald J. — Mich.
B.S. 1956, Michigan State University of Agriculture and Applied Science

Sinrod, Donald E. — D.C.
A.B. in Govt. 1959, The George Washington University

Sixbey, Daniel W. — Md.
A.B. 1954, University of Maryland

Skinner, John V. — Ga.
B.S. 1955, Alabama Polytechnic Institute

Skogquist, Harland S. — D.C.
B.S. in M.E. 1960, Michigan College of Mining and Technology

Skopic, Charles E. — Va.
B.S. 1959, Pennsylvania State University

Skuba, Michael — Conn.
A.B. 1952, New York University

Slover, Julius E. — Va.
B.S. in Ed. 1942, Southeast Missouri State College
LL.B. 1947, University of Texas

Sluck, William J. — Pa.
B.S. in Ed. 1959, Pennsylvania State Teachers College, East Stroudsburg

Smallwood, William E. — Md.
B.S. 1960, Bradley University

Smethurst, Raymond S., Jr. — D.C.
B.Met.E. 1958, Cornell University

Smith, Al L. — Md.
B.S. 1957, Pennsylvania State University

Smith, Donald L. — Iowa
B.S. 1954, Iowa State College of Agriculture and Mechanic Arts

Smith, Jerome D. — Ala.
A.B. 1958, University of Alabama

Smith, Joe M. — Ark.
A.B. 1961, The George Washington University

Smith, Richard H. — Va.
B.S. 1959, Lehigh University

Smith, Robert W. — Md.
B.E.E. 1955, Rensselaer Polytechnic Institute

Snead, James E. — Texas
B.S. in E.E. 1959, University of New Mexico

Snyder, Edward J. — D.C.
A.B. 1955, Catholic University of America

Snyder, Marvin — D.C.
B.E.E. 1954, Cornell University

Soerodjo, R. — Indonesia
Law Degree 1960, Godjahmaha University, Indonesia

Sokolik, Frank F. — Va.
A.B. 1953, Idaho State College

Sousa, John L. — R.I.
A.B. 1960, Boston University

Spaeth, Earl C. — Va.
A.B. 1942, Oberlin College
Ph.D. 1946, University of California

Sperry, Electra A. — Va.
A.B. 1955, Pennsylvania State University

Spiher, Alan T. — Va.
A.B. 1939, University of California

Spradlin, Thomas R. — D.C.
A.B. 1959, The George Washington University

Sprouse, Richard L. — Md.
B.S. 1957, West Virginia University

Spruill, William G. — Va.
B.B.A. 1961, College of William and Mary

Spurgeon, Johnny M. — Okla.
B.S. 1959, University of Oklahoma

Stack, Norman L. — Md.
B.S. 1957, University of Maryland

Stafford, John R. — N.J.
A.B. 1959, Dickinson College

Stahl, Robert F. — Pa.
B.S. 1954, Washington College

Stanhagen, William H. — Va.
B.E. 1953, University of Southern California
J.D. 1959, The George Washington University

Stanley, Sandra L. — D.C.
A.B. 1960, University of Colorado

Stanton, James A. — Ind.
A.B. 1959, Wabash College

Staton, Robert V. — N.C.
A.B. 1958, University of North Carolina

Staudt, James E. — Va.
B.S. in M.E. 1957, North Dakota Agricultural College

Stavros, George P. Ky.
A.B. 1958, Centre College of Kentucky
Steffen, Tommy L. Utah
B.S. 1957, University of Utah
Stein, Donald P. Ohio
B.S. 1958, Case Institute of Technology
Stein, Murray R. Md.
B.S. 1953, D.C. Teachers College
Steinmetz, Richard C. Ill.
B.S. in M.E. 1957, Purdue University
Stephenson, Garth A. Idaho
A.B. 1951, Brigham Young University
Stephenson, Richard I. Kans.
A.B. 1958, University of Kansas
Stern, Howard L. Md.
A.B. in Govt. 1959, The George Washington University
Stern, Marvin R. D.C.
B.S. in Ch.E. 1958, Drexel Institute of Technology
Stern, Marshall J. D.C.
B.S. 1959, Michigan College of Mining and Technology
M.B.A. 1960, University of Michigan
Stern, Sheldon D.C.
B.D. 1958, New York University
Sternfels, Lewis B. D.C.
A.B. 1955, B.S. 1956, Columbia University
Stevens, Gerald F. Conn.
A.B. 1960, University of Connecticut
Stiburek, Beverly J. Idaho
B.S. 1955, Brigham Young University
Stigaard, John H. Fla.
B.S. 1960, University of Pennsylvania
Stinnett, Robert J. Fla.
B.S. 1948, University of Virginia
Stirman, Stanley M. D.C.
A.B. 1956, Pennsylvania State University
Stock, Eugene A. Md.
A.B. 1955, University of Washington
Stockman, Gene W. N.D.
B.S. 1958, North Dakota Agricultural College
Stoffel, Wolmar J. D.C.
B.S. 1957, University of Wisconsin
Stohlton, John B. Calif.
B.S. 1960, Brigham Young University
Stokes, John M. Texas
A.B. 1961, Texas Technological College
Stokes, Preston W. D.C.
B.S. 1957, Clemson Agricultural College
Stolarz, Francis J. N.J.
A.B. 1956, Johns Hopkins University
Stone, Robert L. N.Y.
B.S. 1958, Queens College
Stone, Robert R., Jr. Va.
A.B. 1958, William Jewell College
Stone, Steven F. Va.
B.Ch.E. 1957, Rensselaer Polytechnic Institute
Strobel, Raymond S. La.
B.S. in M.E. 1956, Washington University
Strompf, Jan A. Md.
B.S. 1958, University of Maryland
Studebaker, Blair R. Pa.
B.S. 1956, Pennsylvania State University
Sturm, Rex L. Nebr.
B.S. in I.E. 1959, Iowa State University of Science and Technology
Sturtevant, Peter A. D.C.
A.B. 1953, Rollins College
Sullivan, John Ill.
A.B. 1958, Loras College
Sullivan, Lawrence R. Va.
B.S. 1959, Pennsylvania State University
Sullivan, Paul E. Mass.
B.S. in Ch.E. 1960, Northeastern University
Sullivan, Robert C. R.I.
B.S. 1955, Brown University
Sullivan, Robert E. D.C.
A.B. 1949, University of Maine
Sullivan, Vincent E. Calif.
B.Ch.E. 1958, Villanova University
Susman, Peter M. D.C.
A.B. 1951, Queens College
A.M. 1954, University of Virginia
Sutton, John P. Va.
A.B. 1956, University of Virginia
Swankin, David A. Md.
A.B. 1954, Brandeis University
M.S. 1957, University of Wisconsin
Swartz, William J. Kans.
B.S. in M.E. 1956, Duke University
Sweeney, John L. Mich.
A.B. 1951, A.M. 1954, Michigan State University of Agriculture and Applied Science
Swope, William E. Va.
A.B. 1958, University of New Mexico
Sykes, Grant R. D.C.
B.B.A. 1950, Tulane University
A.M. in Govt. 1953, The George Washington University
Szabo, Joseph E. Va.
B.E.E. 1956, McGill University
Szervo, Patricia A. Va.
A.B. 1949, LL.B. 1952, Temple University

T

Tabak, Gary Pa.
B.S. in E.E. 1961, University of Pennsylvania
Tacke, John B. Wash.
A.B. 1956, St. Edward's Seminary
Talbot, John M. Md.
B.S. 1959, University of Maryland
Tate, Michael D. Va.
A.B. 1961, University of Maryland
Taulbee, John E. Ill.
A.B. 1958, St. Ambrose College
Taylor, Daniel A., Jr. D.C.
A.B. in Govt. 1960, The George Washington University
Taylor, Peter S. Kans.
A.B. 1960, Washburn University
Teberg, Richard L. Iowa
A.B. 1958, State University of Iowa
Tegtmeyer, Rene D. N.Y.
B.S. in M.E. 1956, Washington University
Temple, Sarah B. Kans.
A.B. 1958, Vassar College
Terzian, Louise A. Md.
B.S. 1954, University of Pennsylvania
Teschner, David Va.
B.S. in E.E. 1955, Newark College of Engineering
Thomas, Carl O. Texas
B.S. 1957, Texas College of Arts and Industries
Thompson, John C. Va.
B.S. 1957, University of Rochester
Thompson, Robert Ill.
B.S. 1958, University of Illinois
Thompson, Robert K. Del.
B.S. 1960, Temple University
Thornton, William C. Nev.
A.B. 1958, University of Nevada
Tindal, Donald R. Va.
B.S. 1954, University of Maryland
Tocker, Edwin Md.
B.S. 1956, Pennsylvania State University
Toothman, Byron R. W.Va.
A.B. 1946, Fairmont State College
A.M. 1948, West Virginia University
Tower, Robert G. Md.
B.S. 1941, U.S. Naval Academy
Townsend, Donald E. Va.
B.S. 1959, University of Missouri
Townsend, William C. Va.
B.S. in Met.E. 1958, University of Pittsburgh
Tranchitella, Nicola Md.
B.S. 1954, Indiana University
Treese, James R. Pa.
A.B. 1956, Colgate University

Trousof, Natalie — D.C.
A.B. 1947, A.M. 1950, Columbia University
Tucker, Michael F. — Del.
A.B. 1960, University of Delaware
Tucker, Robert P. — Md.
A.B. in Govt. 1960, The George Washington University
Tung, Tahsung — D.C.
B.S. 1960, University of Maryland
Turnage, Kirby L. — Va.
A.B. 1957, University of Alabama
Turpen, Donald C. — N.M.
B.S. 1959, University of New Mexico
Turshen, Ethan A. — D.C.
A.B. 1954, Kenyon College
M.P.A. 1955, Syracuse University
Twohey, Thomas M. — Md.
B.S. 1959, University of Maryland

U

Udui, Kaleb — Koror-Palau Islands
A.B. 1960, The George Washington University
Uilkema, John K. — Va.
B.S.E. 1957, University of Michigan
Urbach, Peter F. — Va.
B.S. in E.E. 1957, Carnegie Institute of Technology
Urey, David S. — W.Va.
B.S. in I.E. 1958, Northwestern University
Urrey, Marvin W. — Va.
B.S. in M.E. 1959, New Mexico State University

V

Van Blois, Robert L. — Pa.
A.B. 1961, The George Washington University
Vandenburg, John P. — Mich.
B.S.E. 1956, University of Michigan
Vande Sande, George — Md.
B.S.E. 1948, University of Michigan
Van Kirk, Roger A. — N.J.
B.S. in E.E. 1957, University of Vermont
Van Metre, John L., Jr. — W.Va.
A.B. 1959, Duke University
van Santen, William A., Jr. — Minn.
B.S. in C.E. 1961, Illinois Institute of Technology
Vatske, Albert I. — Conn.
A.B. 1959, University of Connecticut
Vaughan, Roger A., Jr. — D.C.
B.S. 1956, U.S. Merchant Marine Academy
Vernon, Kenneth W. — Wash.
B.S. 1959, University of Texas
Vetter, John E. — Md.
A.B. 1953, University of Rochester
Viccellio, Nancy B. — Va.
A.B. 1934, Meredith College
A.M. 1939, University of Virginia
Vick, Kendall L. — Fla.
A.B. 1953, Washington University
M.S. 1960, University of London, England
Vipond, Richard J. — Iowa
A.B. 1961, The George Washington University
Visek, Franklin J. — Nebr.
B.S. 1957, Municipal University of Omaha
Visick, Hubert H. — Md.
A.B. 1955, Brigham Young University
Vital, Jack H., III — Va.
B.B.A. 1961, Marshall University
Volterra, Max — Mass.
B.S. 1957, Brown University

W

Wakefield, Blair P. — Va.
B.S. 1941, University of Pittsburgh
Walker, Lee E. — Va.
B.S. 1958, Brigham Young University
A.M. in P.A. 1961, The George Washington University
Waller, John R. — Md.
B.S. 1953, Georgetown University
Wallis, Charles B. — N.Y.
B.S. 1959, Northwestern University
Walls, Donald F. — D.C
A.B. 1954, M.B.A. 1959, Cornell University
Walters, Gomer W. — Pa.
B.E. 1960, Yale University
Ward, Hugh W., Jr. — Va.
A.B. in Govt. 1959, The George Washington University
Ward, Julia — D.C.
A.B. 1923, Ph.D. 1940, Bryn Mawr College
Wasniewski, James L. — Ill.
A.B. 1960, Marquette University
Watkins, William H. — D.C.
A.B. 1958, LL.B. 1960, West Virginia University
Watkinson, William W. — Mich.
A.B. 1959, Western Michigan College
Watson, William E. — W.Va.
A.B. 1958, West Virginia Wesleyan College
Weakley, Harold W. — Tenn.
B.S. 1954, Tennessee Polytechnic Institute
Webb, Thomas H. — Md.
B.S. in C.E. 1944, Ohio Northern University
Webb, Walter L. — Kans.
A.B. 1961, Texas Christian University
Webster, David Z. — Mass.
A.B. 1957, Bowdoin College
Weeks, Cora E. — D.C.
A.B. 1957, Miami University
Weilacher, Robert G. — D.C.
B.S. 1957, Columbia University
Weitz, Irwin I. — Mass.
A.B. 1958, American International College
Welch, John E. — Maine
B.S. 1953, University of Maine
Weld, John P. — Md.
B.S. 1957, East Carolina College
Wells, Alfred H., Jr. — Va.
B.S. 1955, University of South Carolina
Wenger, Don S. — Md.
A.B. 1934, University of Wisconsin
M.D. 1937, Marquette University
M.S. 1957, Georgetown University
Werdegar, Kathryn J. — Calif.
A.B. 1957, University of California
Werdig, Robert M., Jr. — N.M.
B.S. 1960, University of New Mexico
West, Ronald D. — Md.
A.B. in Govt. 1958, The George Washington University
Westerman, Christian C. — Texas
B.S. 1955, University of Virginia
Western, Marion W. — Utah
B.S. 1961, Utah State University of Agriculture and Applied Science
Wheeless, Kenneth G. — D.C.
B.S. 1959, University of Arkansas
Whisenhunt, Fred S. — D.C.
B.Ch.E. 1956, North Carolina State College
Whisler, John W. — Iowa
B.S. 1957, Iowa State College of Agriculture and Mechanic Arts
White, Leonard A. — Md.
B.M.E. 1959, The George Washington University
Whitescarver, James — D.C.
A.B. 1953, Duke University
Whitlock, Douglas H — Va.
A.B. 1955, Duke University
Wiener, Richard — D.C.
A.B. 1950, Columbia University
Wilbur, Helen J. — Va.
A.B. 1956, Bates College
Wildhack, William A. — Va.
B.S. 1957, Miami University

Willette, Helen B. D.C.
A.B. 1941, Syracuse University
Williams, Edwin A. Okla.
A.B. 1961, Oklahoma State University of Agriculture and Applied Science
Williams, Gerald E. Va.
B.S. 1955, Delta State College
Williams, James A. Nebr.
B.S. in C.E. 1958, University of Nebraska
Williams, James W. Va.
B.S. in E.E. 1957, Vanderbilt University
Williams, Jerry D. Okla.
B.B.A. 1959, University of Oklahoma
Williams, Melvin P. Va.
B.E.E. 1957, Rensselaer Polytechnic Institute
Williamson, Walter L. D.C.
B.S. 1960, Brigham Young University
Willinger, Warren J. N.Y.
A.B. in Govt. 1959, The George Washington University
Willis, Betty J. Ga.
B.S. in Nursing 1950, M.B.A. 1957, University of Pittsburgh
Willis, Floyd III Md.
A.B. 1961, University of Maryland
Wilson, Harold K. Va.
LL.B. 1955, University of Oklahoma
B.B.A. 1961, The George Washington University
Winebrenner, Tommy L. D.C.
B.S. 1960, American University
Winer, David E. Va.
B.E. 1956, Vanderbilt University
Wing, John A. D.C.
A.B. 1958, Union College
Wintercorn, Richard A. D.C.
A.B. 1957, Rockford College
Wise, Joseph G. Utah
B.S. 1960, Brigham Young University
Wise, Robert W. Md.
B.S. 1956, McPherson College
Wisecarver, Betty M. D.C.
A.B. 1957, Mary Washington College
Witt, William H. Md.
A.B. 1941, Harvard University
Wohl, Paul N.Y.
A.B. in Govt. 1954, The George Washington University
Wolfe, Alan D. N.Y.
B.S. 1952, Queens College
Wolfe, William S. N.Y.
B.S. in E.E. 1959, Lehigh University
Wolff, Nancy J. N.Y.
A.B. 1954, Wellesley College
Wolson, Milton M. N.Y.
B.S. in A.E. 1959, University of Alabama

Wood, Richard L. Mich.
B.S. in M.E. 1958, M.B.A. 1959, University of Michigan
Woodruff, Eugene B. Mich.
B.S. 1954, University of Michigan
M.D. 1957, Purdue University
Worthington, Raymond L. Md.
B.S. 1941, University of Maryland
Wray, James C. N.Y.
B.M.E. 1958, Villanova University
Wright, Charles K. S.C.
B.S. 1942, Clemson Agricultural College
LL.B. 1948, University of South Carolina
Wright, Joseph S., Jr. Ill.
A.B. 1960, Beloit College
Wyman, Charles M. Mass.
A.B. 1955, The George Washington University

Y

Yeager, Frederick G. Iowa
B.S. 1960, University of South Dakota
Young, Charles J. Va.
A.B. 1961, Randolph-Macon College
Young, Donald P. Md.
A.B. 1961, University of Maryland
Young, Glenn F. D.C.
B.S. 1953, U.S. Coast Guard Academy
Young, Roger D. D.C.
A.B. 1957, Randolph-Macon College

Z

Zanfagna, Philip E. Mass.
A.B. 1958, Ohio Wesleyan University
B.D. 1961, Yale University
Zeiger, Leon D.C.
Zeldon, Joan M. D.C.
A.B. 1960, Smith College
Zettler, Arthur M. Md.
A.B. 1959, University of Maryland
Zieg, Robert L. Va.
B.I.E. 1956, General Motors Institute
Ziehm, Eugene C. N.Y.
A.B. 1959, University of Buffalo
Zinn, Robert J. Pa.
B.M.S. 1958, M.S. 1959, Bucknell University
Zoole, Jon L. N.Y.
A.B. 1960, Duke University
Zugel, Francis K. Md.
B.S. in Eng. 1957, The George Washington University
Zugschwerdt, David W. Tenn.
A.B. 1961, Northwestern University

SUMMARIES OF REGISTRATION

SPRING SEMESTER 1960–61, SUMMER TERM 1961
FALL SEMESTER 1961–62

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

Alabama	6	New Hampshire	6
Alaska	2	New Jersey	36
Arizona	3	New Mexico	5
Arkansas	6	New York	75
California	12	North Carolina	11
Colorado	8	North Dakota	6
Connecticut	10	Ohio	28
Delaware	7	Oklahoma	12
District of Columbia	191	Oregon	4
Florida	22	Pennsylvania	64
Georgia	7	Rhode Island	4
Hawaii	5	South Carolina	9
Idaho	13	South Dakota	6
Illinois	31	Tennessee	6
Indiana	13	Texas	16
Iowa	23	Utah	20
Kansas	11	Vermont	1
Kentucky	4	Virginia	276
Louisiana	7	Washington	8
Maine	5	West Virginia	16
Maryland	172	Wisconsin	11
Massachusetts	30	Wyoming	1
Michigan	27	Panama Canal Zone	1
Minnesota	6	Canada	1
Mississippi	2	Cuba	1
Missouri	7	Indonesia	1
Montana	2	Mexico	1
Nebraska	8	Palau Islands	1
Nevada	3		

GRADUATES OF COLLEGES REGISTERED IN THE LAW SCHOOL

Abilene Christian College	1	Bowling Green State University	3
Adams State College	1	Bradley University	2
Alabama Polytechnic Institute	3	Brandeis University	1
Alabama, University of	8	Brigham Young University	23
Alfred University	2	Brooklyn College	5
Allegheny College	1	Brooklyn, Polytechnic Insitute of	2
American International College	2	Brown University	8
American University	12	Bryn Mawr College	1
Amherst College	2	Bucknell University	5
Anderson College	1	Buffalo, University of	5
Antioch College	1	Butler University	1
Arizona, University of	5	California State Polytechnic College	2
Arkansas, University of	4	California, University of, Los Angeles	9
Augustana College	1	California, University of, Berkeley	1
Bates College	2	Calvin College	1
Beloit College	2	Canisius College	1
Berlin, University of, Germany	1	Carnegie Institute of Technology	6
Boston College	3	Case Institute of Technology	4
Boston, State Teachers College at	1	Catholic University of America	5
Boston University	4	Centenary College	1
Bowdoin College	3	Central Institute of Political Science	1

Central Missouri State College	1
Central Normal College	1
Centre College of Kentucky	2
Chicago, University of	2
Cincinnati, University of	5
Clark University	1
Clarkson College of Technology	1
Clemson Agricultural College	8
Colgate University	5
Colorado School of Mines	1
Colorado State University	1
Columbia University	16
Concordia College	1
Connecticut, University of	6
Cornell University	18
Creighton University	1
Dartmouth College	2
Dayton, University of	1
Delaware, University of	2
Delta State College	1
Denison University	1
Denver, University of	1
DePauw University	3
Dickinson College	7
District of Columbia Teachers College	2
Drake University	1
Drexel Institute of Technology	14
Duke University	17
East Carolina College	1
East Tennessee State College	1
Fairmont State College	2
Florida State University	1
Florida, University of	8
Fordham College	1
Fordham University	7
Franklin and Marshall College	2
General Motors Institute	2
George Washington University, The	111
Georgetown University	23
Georgia Institute of Technology	8
Georgia State College for Women	1
Georgia, University of	3
Gettysburg College	1
Godiahmaha University, Indonesia	1
Gonzaga University	1
Guadalajara, University of, Mexico	1
Hamline University	1
Hampden-Sydney College	1
Harvard University	11
Havana, University of, Cuba	1
Haverford College	2
Hawaii, University of	1
Heidelberg, University of, Germany	1
Hillsdale College	1
Hofstra College	2
Hood College	1
Howard University	1
Hunter College	3
Idaho State College	3
Illinois Institute of Technology	2
Illinois, University of	15
Illinois Wesleyan University	1
Indiana University	5
Inter-American University of Puerto Rico	1
Iowa State Teachers College	2
Iowa, State University of	9
Iowa, State University of Science and Technology	4
Jagellonian University, Alaska	1
Jamestown College	1
John Carroll University	1
Johns Hopkins University	4
Kansas State Teachers College	1
Kansas State University of Agriculture and Applied Science	2
Kansas, University of	7
Kentucky, University of	3
Kenyon College	2
Lafayette College	8
LaSalle College	1
Lebanon Valley College	1
Lehigh University	6
Lemoyne College	1
Lincoln University	1
London, University of, England	1
Long Island University	1
Loras College	1
Louisiana College	1
Louisiana State Agricultural and Mechanical College	4
Loyola University	3
Macalester College	1
Maine, University of	4
Marquette University	5
Marshall College	2
Maryland State Teachers College, Frostburg	1
Maryland, University of	82
Mary Washington College	1
Massachusetts Institute of Technology	4
Massachusetts, University of	5
McGill University	1
McKendree College	1
McPherson College	1
Meredith College	1
Miami University	3
Miami, University of	7
Michigan College of Mining and Technology	7
Michigan State University of Agriculture and Applied Science	10
Michigan, University of	22
Middlebury College	1
Minnesota State Teachers College, Moorhead	1
Minnesota State Teachers College, Mankato	1
Minnesota, University of	4
Mississippi Southern College	2
Mississippi, University of	2
Mississippi, State University	1
Missouri, University of	6
Morris Harvey College	2

Montana School of Mines	1
Montana State College	4
Montana State University	1
Montreal University, Canada	1
Muhlenberg College	2
Municipal University of Omaha	1
National University	1
Nebraska, University of	6
Nebraska Wesleyan University	2
Nevada, University of	1
Newark College of Engineering	5
New England College	1
New Hampshire, University of	9
New Jersey State Teachers College, Montclair	1
New Mexico State University	1
New Mexico, University of	9
New York, College of the City of	12
New York State University	1
New York University	8
Niagara University	1
North Carolina, Agricultural and Technical College of	1
North Carolina State Teachers College	4
North Carolina, University of	7
North Dakota Agricultural College	4
North Dakota, University of	2
North Texas State College	2
Northeastern University	9
Northwest Missouri State College	1
Northwestern University	6
Northwestern Technological Institute	2
Notre Dame, University of	8
Oberlin College	2
Ohio Northern University	1
Ohio State University	11
Ohio University	4
Ohio Wesleyan University	3
Oklahoma State University of Agriculture and Applied Science	1
Oklahoma, University of	16
Oregon State College	3
Oregon State University	2
Oregon, University of	3
Ottawa, University of, Canada	1
Palmany Peter University, Hungary	1
Pennsylvania State Teachers College, Bloomsburg	1
Pennsylvania State Teachers College, East Stroudsburg	1
Pennsylvania State University	35
Pennsylvania, University of	10
Pittsburgh, University of	14
Pomona College	1
Pratt Institute	1
Princeton University	5
Principia College	1
Purdue University	16
Queens College	3
Randolph-Macon College	3
Rensselaer Polytechnic Institute	21
Rhode Island School of Design	1
Rice Institute	3
Richmond Professional Institute	2
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Trinity University	1
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Union College	1	Washington University	12
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Virginia Polytechnic Institute	8	Williams College	1
Virginia, University of	11	Wisconsin State College	3
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Washburn University	1	Worcester Polytechnic Institute	1
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Washington and Lee University	2	Xavier University	1
Washington Missionary College	1	Yale University	12
		Yeshiva University	1

SUMMARY OF LAW SCHOOL REGISTRATION

FALL SEMESTER 1961–62

	Men	*Women*	*Total*
First Year	276	16	292
Second Year	292	9	301
Third Year	250	14	264
Candidates for degree of Master of Laws	18	2	20
Candidates for degree of Master of Comparative Law	2	....	2
Candidates for degree of Master of Comparative Law (American Practice)	3	1	4
Candidates for degree of Doctor of Juridical Science	6	....	6
Unclassified	15	2	17
TOTAL	862	44	906

INDEX

A

Academic status of the University, 3
Administration, officers:
  Of the University, 2
  Of the Law School, 3
Administrative Assistants, 6
Admission, 16–17
Advanced standing, 9
Amount of work, 21
Attendance, 21

B

Bachelor of Laws, degree of, 8–11

C

Calendar of the School, 1962–63, v
Classification of students, 24
Continuing Legal Education, 12
Course numbers, explanation of, 27
Courses of Instruction, 27–34
Curriculum, Bachelor of Laws and Juris Doctor, 10–11

D

Day Division, 10–11, 15
Degrees conferred February, June, and October, 1961, 35–39
Doctor of Juridical Science, degree of, 7, 12, 14

E

Emeritus professors, 3
Employment, student, 25–26
Entering Classes, 15
Evening division, 11, 15
Examinations, 22
Exclusion and probation for poor scholarship, 23

F

Faculty:
  Of the Graduate School of Public Law, 12
  Of the Law School, 3–6
Fees and financial regulations, 17–19
Fellowships, 19–20
Foreign Lawyers:
  Programs of study for, 7, 12
  Master of Comparative Law, degree of, 14

G

Geographical distribution of students, 59
Grades, 22–23
Graduate School of Public Law, 12–14
Graduates of colleges registered in the School, 59–62
Graduation requirements, 9–10

H

Health Administration, 26
History:
  Of the Law School, 6–7
  Of the University, 2
Honors, 9
Hours of instruction, 15

J

Juris Doctor, degree of, 9 (footnote)

L

Law Review, 16
Law School, 3–11
Law School Admission Test, 9
Legal Aid Program, 24
Library, 15–16
Living accommodations, 25
Loan funds, 21

M

Master of Comparative Law, degrees of, 7, 12, 13, 14
Master of Laws, degree of, 7, 12, 13, 14

N

National Law Center, 7

O

Objectives, 8
Order of the Coif, 25

P

Patent law, 10
Patent, Trade-Mark, and Copyright Law, research in, 7, 33–34
Placement, 16, 25–26
Practice and Trial Practice Court, 10
Prizes, 20–21
Probation, 23
Public Law, research training in, 34

R

Readmission, 17
Refund of tuition, 19
Registration, 17
Regulations, 21–24
Research assistantships, 19
Residence halls, 25
Residence requirements, 9–10
Right to change rules, 24
Right to dismiss students, 24

S

Scholarship, 9, 13–14, 22–23
Scholarships, 20
Student:
  Activities and Services, 24–26
  Bar Association, 24
  Employment, 25–26
Students registered, 40–58
Summaries of Registration, 59–62
Summer Term, 15

T

Teaching Fellows, 6
Trial Practice Court, 10
Trustees, Board of, 1

U

Unclassified students, 9, 23
University:
  Academic status, 3
  Colleges, Schools, Divisions, 2
  History, 2
  Location, 3

V

Van Vleck Case Club, 24

W

Withdrawal and refunds, 19



Seminar in Taxation



A Session of the Trial Practice Court

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

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Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

National Law Center:

Law School: Bachelor of Laws (LL.B.)

Graduate School of Public Law: Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)

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THE UNIVERSITY HOSPITAL, 1898

The George Washington University

Bulletin



THE SCHOOL OF ENGINEERING

1962-63

WASHINGTON 6, D. C.
NOVEMBER 1961
Vol. LXI No. 3

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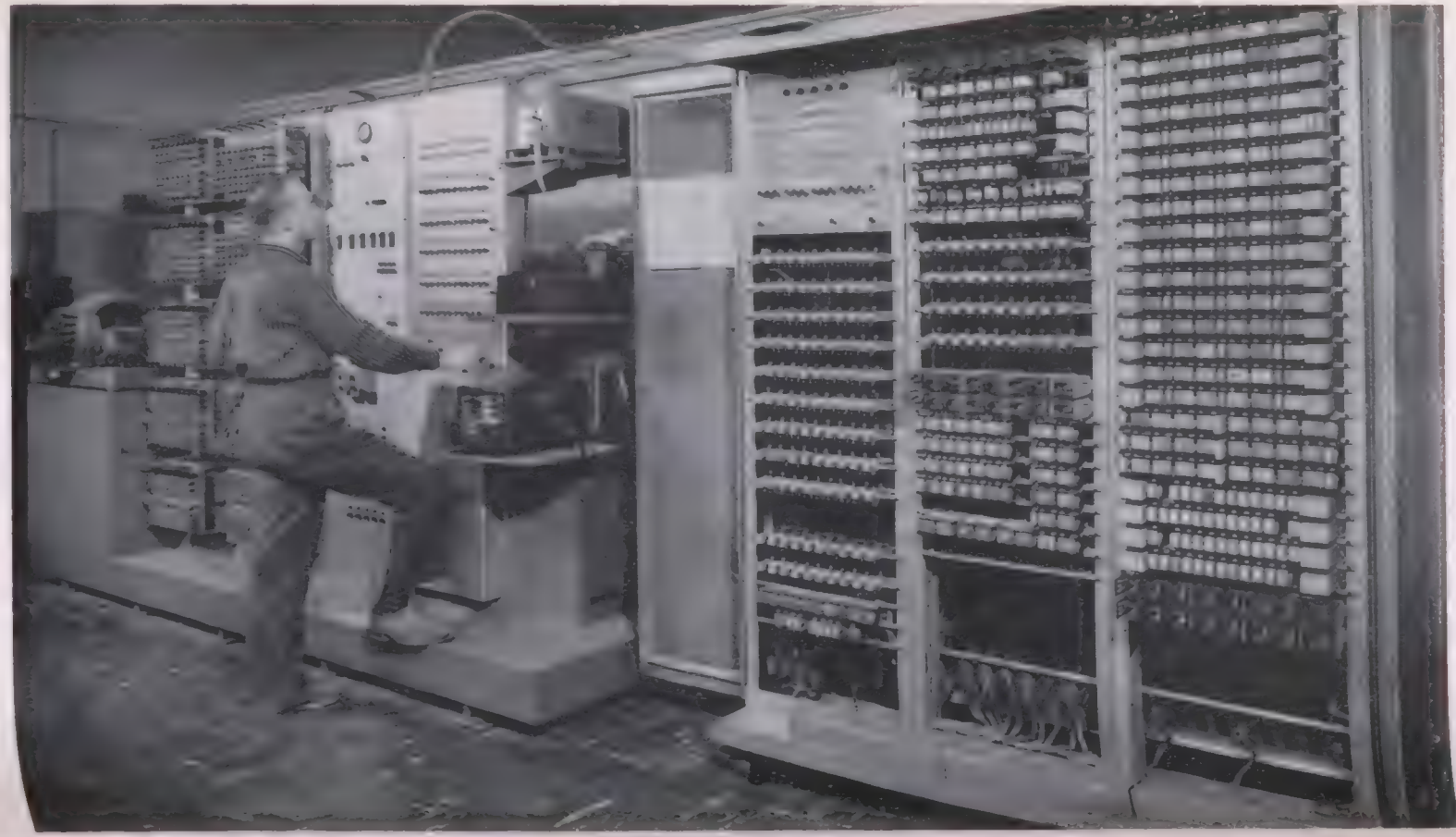
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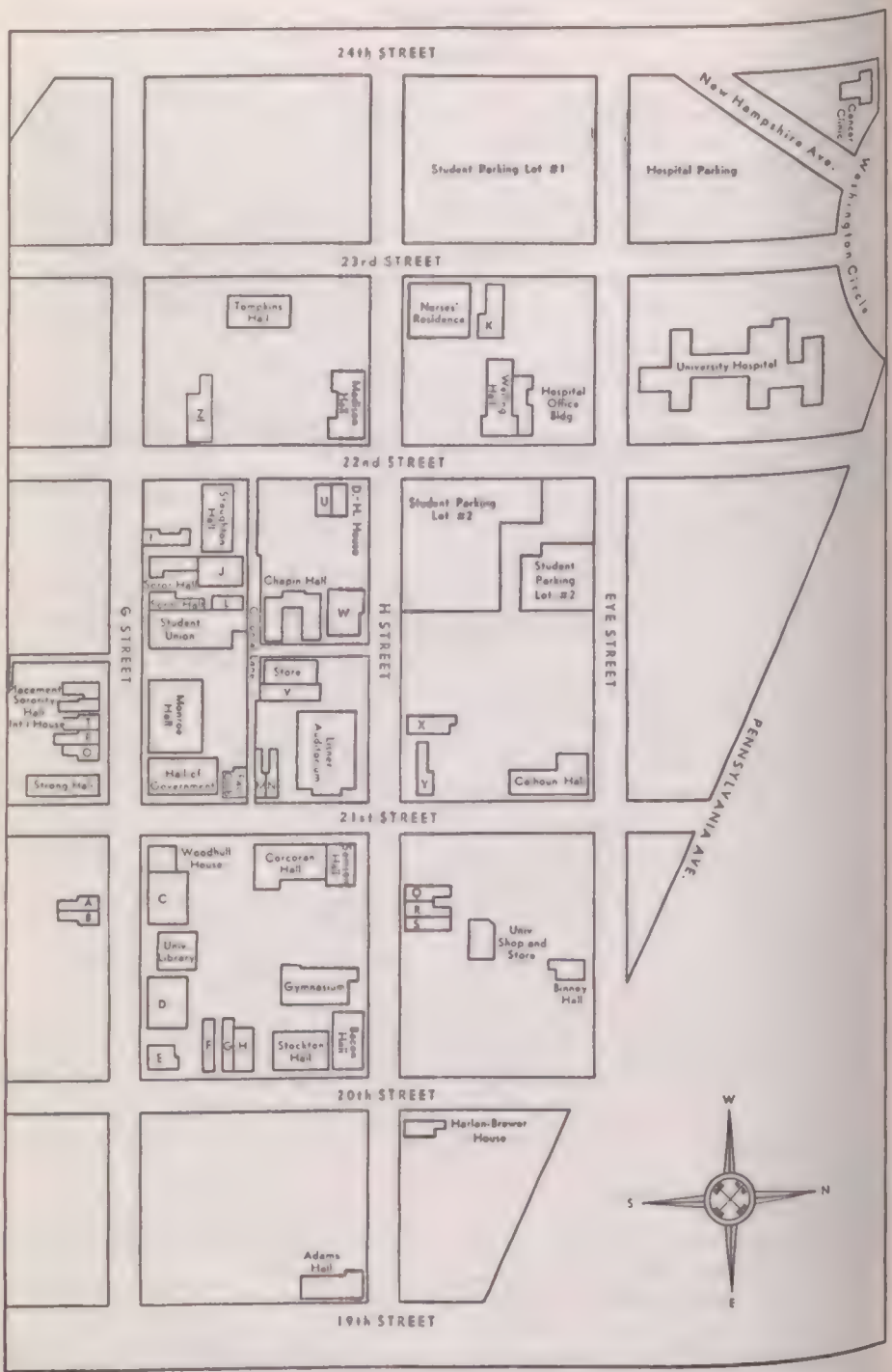


The George Washington University

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THE SCHOOL OF ENGINEERING
1962-63

VOLUME LXI NOVEMBER 1961 NUMBER 3


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Cancer Clinic
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23rd STREET
Tompkins Hall
Madison Hall
Nurses' Residence
K
Watkins Hall
Hospital Office Bldg
University Hospital
22nd STREET
Stockton Hall
D-HL House
Student Parking Lot #2
Chapin Hall
W
Student Union
G STREET
H STREET
EYE STREET
Store
V
Monroe Hall
Hall of Government
Linner Auditorium
X
Y
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21st STREET
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C
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Gymnasium
E
F
G
H
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THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington. During his public life he urged the establishment of such an institution; and in his will he left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of Columbian College of Arts and Sciences which offers work leading to the Associate in Arts, Associate in Science, the Bachelor's, and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine; Law; Engineering; Pharmacy; Education; and Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The George Washington University is a privately endowed University located on a well planned campus in the center of Washington within a few blocks of the White House. The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an ex officio member of the Board.

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The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

Those curricula of the School of Engineering which are within the purview of the Engineers' Council for Professional Development are accredited by that agency.

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The George Washington University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

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Peter Hans Sawitz, M.S. in E.E., *Lecturer in Electrical Engineering*
Lewis Slack, Ph.D., *Professor of Physics*
Herbert Ernest Smith, C.E., Ph.D., *Professor of Engineering Administration, Director of Engineering Administration Program*
Howard Livingston Stier, Ph.D., *Professorial Lecturer in Statistics (Engineering Administration Program)*
Carl Hugo Walther, B.E., M.C.E., *Professor of Civil Engineering; Assistant Dean in the School of Engineering*
Kenneth William Webb, A.B., *Associate Professorial Lecturer in Engineering Administration*
David Gover White, B.Chem. Eng., Ph.D., *Associate Professor of Chemistry*
Thomas Breeden Wiggins, B.E.E., *Associate in Electrical Engineering*

ASSISTANTS IN INSTRUCTION

Thomas Carroll, Jr., B.C.E., *Graduate Teaching Assistant in Civil Engineering*
Nicholas Kordellas, B.A. Sc., *Graduate Teaching Assistant in Mechanical Engineering*
Geoffrey Umio Uyehara, A.B., *Graduate Teaching Assistant in Electrical Engineering*

ADMINISTRATIVE ASSISTANTS

Gladys May Lacey, *Secretary to the Dean*
Maria Henrietta Dame, *Secretary*
Anne Louise Rocca, *Clerk-Typist*
Jane Reaney Linton, *Clerk-Typist*

COMMITTEES*

The Dean's Council†

1963: P. A. Crafton, N. T. Grisamore; 1964: R. R. Fox, C. R. Naeser;
1965: Louis dePian, M. S. Ojalvo

Committee on Admission and Advanced Standing

C. H. Walther *(Chairman)*, R. R. Fox, A. C. Meltzer, M. S. Ojalvo

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* The Dean of the School and the Assistant Dean in the School are members ex officio of all committees. Membership of committees listed here is for the academic year 1961–62.
† Elected by the Faculty.

Committee on Scholarship

R. R. Fox *(Chairman)*, R. L. Dedrick, C. D. Ferris

Committee on Graduate Studies*

M. A. Mason *(Chairman)*, G. M. Arkilic, Louis dePian, M. S. Ojalvo, H. E. Smith

Committee on Research

N. T. Grisamore *(Chairman)*, R. L. Dedrick, A. C. Meltzer

GENERAL INFORMATION

INTRODUCTORY

The School of Engineering was organized October 1, 1884 as the Corcoran Scientific School of Columbian University and was situated in the University Building then at 15th and H Streets, NW. The school was named in honor of William W. Corcoran, Trustee and President of the Corporation from 1869 to 1888. Day and evening courses were offered in Literature, Science, and Technology and led to the degrees of Bachelor of Science, Civil Engineer, Mechanical Engineer, and Mining Engineer. The school was among the first to accept women for degree candidacy in engineering.

In 1903 the Corcoran Scientific School, the School of Graduate Studies, and the Columbian College were merged into a single Department of Arts and Sciences. Engineering degrees were made graduate.

Administrative changes led to The Washington College of Engineering being initiated in 1905 as one of the several semi-independent undergraduate colleges of the University, each with its own Board of Trustees. The College provided instruction leading to undergraduate degrees in engineering and architecture.

In 1909 the name of the College was changed to the College of Engineering and Mechanic Arts, and the curricula were revised to give the student a thorough understanding of the theory underlying engineering practice. Emphasis was placed on the development of a knowledge of scientific principles upon which the student could build and by which he might solve new problems as they are met in practice.

The name of the school was changed again in 1914 to the College of Engineering and later to the School of Engineering. Architecture was dropped from the curriculum and degrees were limited to the field of engineering. However, the primary emphasis upon principles rather than technology which had characterized the School since 1903 was continued and has remained to this day as one of the important distinguishing features of the School.

The location of the School of Engineering in the nation's capital makes available a group of outstanding engineers and scientists as lecturers. It is traditional for the School to include these eminent professional specialists among the staff of instruction.

Since 1884 courses of instruction have been open to both men and women.

Objective

The objective of the School of Engineering is to produce graduates who possess knowledge and understanding of the fundamental scientific principles in their fields of study; some skill in their application; and an attitude of responsibility toward society and the engineering profession.

* Appointed by the Dean upon recommendation of the Faculty.

ORIENTATION PROGRAM*

Students in the School of Engineering participate in the Orientation Program of the University, which is held during the week preceding registration for the fall semester. Events of the program include an advising period when members of the Faculty in the School of Engineering are available for personal interviews to assist students in planning their programs to best prepare them for ultimate goals; an Orientation Assembly, required of all new students; a Curriculum Assembly, for guidance in the selection of courses for the coming semester; placement tests for new students who do not have advanced standing in mathematics and English; qualifying examinations for students who wish to waive curriculum requirements or qualify for advanced standing; scheduled social events; and the opportunity to discuss with older students and with staff members concerned with student activities the extracurricular program of the University, so that a wise and rewarding selection may be made.

The placement tests are required and are scheduled during Orientation week for students entering the School of Engineering, and again during the week prior to the spring registration for students entering at that time. The results are available to students and advisers before registration as a guide to class placement. Students shown by such tests to be inadequately prepared are required to take remedial work before undertaking Engineering courses in areas of deficiency.

Programs of Study

Programs of undergraduate study are offered leading to the Engineering Technologist Certificate and the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering (with optional areas of concentration).

Graduate work is offered under the supervision of the Committee on Graduate Studies, leading to the degrees of Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

HOURS OF INSTRUCTION

Classes are scheduled in the morning, afternoon, and evening. By taking evening and summer classes and extending the time of study beyond the usual four years, a part-time student may complete the requirements for a degree.

VETERANS EDUCATION

The Office of Veterans Education of the University is a service bureau for eligible persons interested in studying at the University. It acts in a liaison capacity between the University and the Veterans Administration. Those who are eligible are advised to consult this Office about the educational program of the University and the procedure for securing benefits, before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D.C.

Public Law 634
(War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the

* See the calendar for dates of scheduled events.

Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1950, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894

(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

SERVICE SCHOOLS CREDITS

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates in the School of Engineering. Veterans should submit to the Director of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the Guide to Evaluation of Educational Experience in the Armed Forces.

AIR FORCE RESERVE OFFICERS' TRAINING CORPS

The Air Force Reserve Officers' Training Corps (Air Force ROTC) unit was established at the University in 1951 under authority of Section 40-47C, National Defense Act of June 3, 1916, as amended. Air Force personnel, approved by the President of the University, are assigned by the Department of the Air Force to supervise and conduct the Air Force ROTC program.

The mission of the Air Force ROTC is to develop in selected university students, through a permanent program of instruction, those qualities of leadership and other attributes essential to their progressive advancement to positions of increasing responsibility as commissioned officers in the United States Air Force. Classroom instruction and leadership training are provided to develop in the stu-

dent the knowledge and the attributes of character, personality, and leadership required of commissioned officers.

Course of Study

The course of study is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

Many academic subjects in the University's liberal arts program have a direct relationship to military as well as to civilian careers. Consequently, some of these have been substituted for academic courses included in standard Air Force ROTC curricula. Courses have been carefully selected to avoid duplication in instruction and to provide practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral and written expression, and the techniques of problem solving are emphasized throughout the course, both in theory and practice.

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately $500, which is exempt from income tax. During the period of summer training, cadets receive $75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet.

Eligibility Requirements

Enrollment in the Division of Air Science basic course is open to all men students who are at least 14 years of age, physically fit, of good character, and candidates for a Bachelor's degree. All students enrolling in the basic course are required to successfully complete the two-year course as a prerequisite to graduation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

A cadet enrolled in the advanced course must successfully complete the junior- and senior-year Air Science curricula and summer training unit as a prerequisite to graduation. Upon graduation he is obligated to accept a commission in the United States Air Force, if tendered. Any cadet who for academic, physical, or other reasons becomes disqualified for a commission is relieved of this obligation. Cadets enrolled in the category leading to pilot training may be required to pursue a 35-hour course of flying instruction during the senior year. This flying instruction is provided by a Civil Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

Military Service Delay

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas. Normally, a cadet is not considered for draft deferment until he has completed one semester's work in the University, with a quality-point index of at least 2.00. A cadet's deferment is subject to withdrawal if his quality-point index falls below 2.00.

STUDENT LIFE

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus,

a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

LIVING ACCOMMODATIONS

The University maintains five residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives may live outside the dormitories only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. In no case will permission be granted for such

* A charge of $2 for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

† See Rule (5) for exception.

girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Freshman girls may be domiciled outside the dormitory only with their parents or with immediate relatives with the written approval of their parents.

Women Students.—The Hattie M. Strong Hall provides single rooms at $47.50 a month and double rooms at $40 a month a person.

The Dolly Madison Hall provides double rooms at $40 a month a person.

Men Students.—Welling Hall provides double rooms at $30 a month a person.

The John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent at $40 a month a person.

The John C. Calhoun Hall provides 75 double rooms at $40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of $2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of $5.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

University Chapel

The University Chapel is a nonsectarian service of workship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling on personal problems.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

DAVIS-HODGKINS HOUSE

The Davis-Hodgkins House, 731 Twenty-second Street NW., is the engineering student center, providing lounges, reading rooms, and student organization offices. The House provides convenient, comfortable facilities for the exchange of ideas and good fellowship among student engineers.

INTERNATIONAL HOUSE

The International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting officers. The services of the Counseling Center are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

THE TESTING AND COUNSELING CENTER

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

The Center provides special testing services including: diagnostic tests prescribed by the School of Engineering, admissions tests for the University and for other educational institutions, and tests for business and industry.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is $7.50; for students currently enrolled in the University but not as degree candidates, the fee is $30; for graduates of the University, $30; for community clients, $45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

THE READING CLINIC

The Reading Clinic, 2018 I Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition

special reading improvement classes are conducted on the high school and adult level.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is $35; for individual instruction, $4.50 a lesson; for semi-individual instruction, $3.50 a lesson; for instruction in small groups with common reading difficulties, $2.75 a lesson; for materials, $4. All fees are payable in advance at the Office of the Cashier.

STUDENT ACTIVITIES

Directors of Student Activities

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all nonacademic phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

Student Government

Student Council.—The Student Council, which is elected annually by the Student body, is responsible for the conduct of student activities.

Committee on Student Life.—The Committee on Student Life is the judicial branch of the student government. It is composed of not more than seven members of the faculty, two of whom are the Director of Activities for Men and the Director of Activities for Women, appointed by the President of the University, and the following members: President of Student Council, an Editor of the *Hatchet*, President of Mortar Board, President of Omicron Delta Kappa, President of the Interfraternity Council, and President of Panhellenic Council. This Committee has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee. It is granted authority to approve or disapprove the establishment of any proposed organization on campus. No student club or society (except social fraternities, sororities, scholastic honor societies, religious or professional clubs or societies) organized as a branch or affiliate of a non-George Washington University organization will be recognized by the Committee on Student Life.

Eligibility for Student Activities

Any student registered in the University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee,

Adams Hall Council, Calhoun Hall Council, Madison Hall Council, Welling Hall Council, Strong Hall Council, or any publications staff

2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

The Engineers' Council

The Engineers' Council is the student governing body for the School of Engineering, composed of two elected representatives from each year class and from the graduate student body, one representative from each student organization in the School, the Business Manager of the *Mechelectiv*, and the House Manager of the Davis-Hodgkins House. The purpose of the Council is to provide liaison between the student body of the School of Engineering and the Faculty Administration, and Student Government of the University in all matters affecting the general interests and welfare of the student body, the School of Engineering, or the University. The Council is maintained financially by the Engineers' Council Fee paid by each student in the School of Engineering, and sponsors the engineers' student magazine, *Mechelectiv;* the Annual Engineers' Mixer, Engineers' Ball, and the Annual Christmas Tree Ceremony in the University Yard. Council meetings are open to all students in the School of Engineering.

The Council acts as the directing body for *Mechelectiv*, which is published six times a year and is sent free to all engineering students. This magazine includes campus and alumni news, a calendar of events, news of the student organizations, and articles on engineering by students and faculty members. The magazine is published by a student Board of Editors and a volunteer student staff.

The control and administration of all student activities are outlined in a separate bulletin.

Sports Activities

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Intersorority Athletic Board cooperate with the departments of Physical Education in conducting the women's intramural and informal extra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

Arts

Interested students may participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III: Enosinian Debate Society; University Dramatic Production Group; and University Glee Club. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

Scheduled Events

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Engineers' Mixers.—At the beginning of each semester the Engineers' Council sponsors a program of orientation, good fellowship, and entertainment to introduce new students.

Engineers' Day.—Sponsored by the Engineers' Council to acquaint high school students and their parents with the School of Engineering.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion In Life Week.—Observed during the week of Thanksgiving, Religion In Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion In Life Week is sponsored by the University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree (given and decorated by the School of Engineering), the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Engineers' Ball.—In the spring the Engineers' Council sponsors the Engineers' Ball, a social event for students and alumni.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions discuss with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa tap new members.

The Colonial Cruise.—An afternoon and evening cruise on the Potomac in the late spring. Students, alumni, and faculty picnic, dance, and engage in games and athletic contests.

STUDENT ORGANIZATIONS

Honor Societies

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.

Sigma Epsilon.—A local engineering honor society established to recognize distinguished scholarship and exemplary character. Members are elected from the top one-eighth of those students in their next-to-last calendar year before graduation and from the top one-fifth of those students in their last calendar year.

Sigma Tau.—A national engineering fraternity, the purpose of which is to recognize scholarship and professional attainment.

Professional Organizations

American Institute of Electrical Engineers—Institute of Radio Engineers (Student Chapter).—Membership open to candidates for the degree of Bachelor of Electrical Engineering.

American Society of Civil Engineers (Student Chapter).—Membership open to students who are candidates for the degree of Bachelor of Civil Engineering.

American Society of Mechanical Engineers (Student Chapter).—Membership open to candidates for the degree of Bachelor of Mechanical Engineering.

Theta Tau (Gamma Beta Chapter).—A national professional (engineering) fraternity. Membership by invitation to outstanding students who have completed successfully at least the freshman year in the School of Engineering.

Social Fraternities

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Sigma Delta, Sigma Nu, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta.

Social Sororities

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi, Sigma Delta Tau.

Religious Organizations

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

Student Publications

Amicus Curiae (Law School publication), *The Cherry Tree* (the annual), *The University Hatchet* (weekly newspaper), *The George Washington Law Review*, *Mecheleciv* (engineers' publication), *The Percolator* (pharmaceutical publication), *The Potomac* (literary magazine), *The Student Handbook*.

Other Organizations

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Calhoun Hall Council, Cheerleaders, Colonial Boosters, Colonial Campus Party, Democratic Club, Flying Sponsors, Foggy Bottom Sports Car Club, Interfraternity Council, Interlaw Fraternity Council, International Relations Club, International Republican Club, Students' Society, Intersorority Athletic Board, Junior Panhellenic Association, Madison Hall Council, Old Men, Senior Panhellenic Association, Strong Hall Council, Student Council, Students for Better Government (political party), Student Legal Aid Society, Station WRGW, University Pep Band, Wandering Greeks, Welling Hall Council, Writers' Club.

ADMISSION

The School of Engineering accepts men and women.

Students may enter at the beginning of the fall semester, the spring semester, or the Summer Sessions.

APPLICATION FOR ADMISSION OR READMISSION

Forms for application for admission or readmission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FEderal 8-0250, extension 344. The completed form should be returned to the Office of the Director of Admissions, with an application fee of $10 for a degree candidate; $5 for a nondegree candidate. The degree candidate must attach to his application a recent photograph, signed by him.

Application for admission or readmission for degree candidacy, together with all required credentials, should be received by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions to insure consideration. Late applications will be considered only if the application form and all required credentials are received in the Admissions Office no later than two weeks prior to the first day of registration for the semester or session for which application is made. Exceptions may be made under extraordinary circumstances, at the discretion of the Director of Admissions.

Applications for nondegree status must be received with necessary credentials no later than the Saturday preceding the first day of registration as stated in the University calendar.

An applicant from a secondary school must send the high school record form provided by the University to his high school principal with the request that the completed form be mailed directly to the Office of the Director of Admissions.

The applicant must request the College Entrance Examination Board to send to the Office of the Director of Admissions the scores of all College Entrance Examination Board Scholastic Aptitude tests and Achievement tests taken. Arrangement for tests is the responsibility of the applicant and should be made with the College Entrance Examination Board, 20 Nassau Street, Princeton, New Jersey, not less than one month before the date of the test. On the application for the test, the student should specify that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

An applicant who has attended one or more institutions of higher learning must request each registrar to mail directly to the Office of the Director of Admissions a transcript of his record, *even though credits were not earned.* An honorable dismissal is required from the institution last attended.

The appropriate report of Graduate Record Examinations, when available, should accompany application for admission to graduate degree candidacy.

APPLICATION FOR READMISSION

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded) must apply for readmission in the Office of Admissions (time stated above) in advance of registration. If the student applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of the Director of Admissions from each institution attended before his application will be considered. Applications for readmission are considered on the basis of regulations currently effective.

ENTRANCE REQUIREMENTS

Good character and academic background appropriate for the program of studies contemplated are required.

For Undergraduate Study

For the Engineering Technologist Certificate and the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering.—Admission is based on the following factors:

1. An acceptable certificate of graduation from an accredited high school showing at least fifteen "units" *
2. The principal's statement that the applicant is prepared to undertake college work
3. Scores on the following College Entrance Examination Board tests: the Aptitude Test, the English Composition Achievement Test, and a Mathematics Achievement Test. If the applicant studied trigonometry in high school he should take the Advanced Mathematics Achievement Test; if he did not study trigonometry in high school he should take the Intermediate Mathematics Achievement Test.

The qualifications of applicants who, because of unusual circumstances, do not meet the above requirements will be considered by the Committee on Admission and Advanced Standing. The Committee may prescribe admission tests.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. General Science may not be counted in satisfaction of the science requirement but may be counted as an elective unit.

It is recommended that *both* physics and chemistry be studied in high school. Study of these sciences contributes to the student's general education, aids in his choice of a career, and affords a qualitative measure of his ability and potential for engineering study. Superior students are encouraged to begin collegiate study of physics or chemistry at the highest level consistent with their preparation, by the use of waiver examinations.

The study of solid geometry is recommended, in order that the student may have a firm foundation for his collegiate studies in mathematics.

Quantitative Deficiency.—A graduate of an approved high school who does not offer for admission the particular subjects required for the engineering curriculum, but who does present not less than fifteen acceptable units, may be admitted to pursue a prescribed program of studies including courses to make up for deficiencies if the deficiency in distribution does not exceed two units.

Qualitative Deficiency.—In the Summer Sessions of 1962 a special program will be available for a limited number of applicants for full time study who do not fully meet qualitative admission requirements. In order to meet the qualifications for admission to degree candidacy all courses in the special program must be passed with an average grade of *C* or better.

Applicants for part time study will be admitted fall, spring, or summer, but must complete the prescribed program of two courses in that semester.

ADVANCED STANDING

Credit for Advanced Placement Examinations

Advanced standing may be granted for study at the collegiate level in advanced courses in an approved secondary school, if substantiated by satisfactory perform-

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

ance in the Advanced College Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the course of study completed by the applicant.

Total credit that may be so granted is ordinarily limited to 15 semester hours, not more than 8 semester hours of which may be in any one examination area. In exceptional cases these limits may be exceeded, but in no case will the credit granted exceed 30 semester hours.

Credit from Higher Institutions

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University, and subject to the general University regulations concerning satisfactory subsequent work.

For Graduate Study

For regulations concerning admission to graduate study toward the degrees of Master of Science in Engineering and Master of Engineering Administration, see page 35; toward the degree of Doctor of Science, see page 39.

For Degree Candidacy

For regulations concerning admission to candidacy for the Master's degrees, see pages 36 and 37.

REGISTRATION

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions.

A student previously registered in the University who was not registered on-campus during the immediately preceding semester (summer session excluded) must apply for readmission in the Office of Admissions in advance of registration. (See "Application for Admission and Readmission", page 17.)

Registration is for the semester unless otherwise indicated on the registration paper. No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in the School of Engineering and in another institution or another division of this University without the permission of the Dean. Allowance of credit for work done concurrently will be at the discretion of the Committee on Admission and Advanced Standing.

Registration in the School of Engineering entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired: (2) the services of the placement Office: (3) the use of the University library; (4) gymnasium privileges: (5) admission to all athletic contests, unless otherwise specified; (6) subscription to *Mecheleciv*, the engineers' student magazine; (7) subscription to the University *Hatchet*, the student newspaper; (8) admission to University debates: (9) medical attention and hospital services as described under Health Administration, pages 9–10. These privileges, except for the

issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

FEES AND FINANCIAL REGULATIONS

Application fee, charged each applicant for admission as a degree candidate, nonrefundable	$10.00
Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable	5.00
Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable	5.00
Tuition Fees:	
For work leading to the Engineering Technologist Certificate and the Bachelor's degrees in Engineering:	
Full-time program (15 hours or more), for each semester	500.00
Part-time program:	
For each semester hour for which the student registers	35.00
For each semester hour for which the student registers for courses in Departments of Instruction other than in the School of Engineering	30.00
For the Master's degrees†:	
For work leading to and including the Comprehensive Examination	900.00
Tuition for all prerequisite course work required will be charged at the normal rate for part-time enrollment in the applicable department of instruction.	
For the degree of Doctor of Science:	
For work leading to and including the Qualifying Examination‡	1,200.00
For work leading to and including the final examination	1,200.00
Graduation fees:	
Wherein the Engineering Technologist Certificate is granted	10.00
Wherein a degree is granted	25.00
Fee for Binding Master's Thesis	6.00
Fee for Printing Summary of Doctoral Dissertation	85.00
Admission Tests (when required)	6.00–12.00
Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree at the time of registration for the final semester	10.00
Late-registration fee, charged each student who fails to register within the designated period	5.00
Change fee, charged each student for each change in program involving one or more than one course	2.00
Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration	5.00
Service fee, charged each student for late payment of tuition	2.00
Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees	5.00
Residence fee,‡ charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements	35.00
For special physical examination	2.00
Engineers' Council fee, charged each student in the School of Engineering for each semester or any part thereof except the summer term	1.50
For each examination to qualify for advanced standing and for each special examination	5.00
Laboratory checkout fee, charged each student in chemistry courses who fails to check out of the laboratory by the time set by the instructor	3.00

* Payable at the time of application for transfer or readmission.

† Tuition is to be paid in full at the time of registration or in two years at the rate of $225 a semester. The tuition must be paid in full before admission to the Comprehensive Examination.

‡ Candidates for the Master's degrees who have paid in full the fee for work leading to and including the Comprehensive Examination but whose Comprehensive Examinations have not been completed will be granted up to one full academic year on an "in residence—no charge" basis, on authorization by the Dean.

Transcript fee, charged for each transcript of record after the first..... 1.00

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

With the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of $2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of $5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Application for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

For regulations governing students in the School of Engineering concerning withdrawal without academic penalty, see page 27.

A student may not withdraw from either the basic course (2 years) or the advanced course (2 years) of the Air Force ROTC without the approval of the President of the University.

No tuition refunds are made to students in the Master's programs. Financial adjustments may be authorized by the Dean in cases of death, physical or mental disability, and termination of studies by reason of scholastic deficiency.

In authorized withdrawals and changes in schedules, financial adjustments will be made as follows:

* The University work week is Monday through Friday, inclusive.

FALL SEMESTER

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of tuition charges.

SPRING SEMESTER

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

A student enrolled in a full-time program, who drops or adds a course and continues to be in a full-time program, will have no financial adjustments of tuition made other than those involving course fees.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration day. In this case a withdrawal fee of $5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Any student in chemistry who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of $3. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equipment, and textbooks on separation from the Corps will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

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* The University work week is Monday through Friday, inclusive.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

SCHOLARSHIPS, PRIZES, FINANCIAL AID

Scholarships and Prizes

The following scholarships and prizes are limited to students in the School of Engineering. The University offers many others which are open to engineering students. A special bulletin containing a complete list and full information concerning teaching fellowships, scholarships, and prizes, may be obtained from the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

Association of Federal Communications Consulting Engineers Scholarship.—This scholarship, which includes tuition, laboratory fees, and books, established in 1958 by the Association of Federal Communications Consulting Engineers (AFCCE), is available to a student of good character, promise, and leadership pursuing a course of study leading to a Bachelor of Electrical Engineering degree and intending to major in communications.

Frederick Albert and Alma Hand Britten Scholarships.—These scholarships, established in 1959 by bequest of Alma Hand Britten, in amounts to be specified from time to time by the Trustees, are available to needy full-time graduate or undergraduate students registered in the School of Engineering, who would not otherwise be able to pursue such professional study. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean.

Henry Harding Carter Scholarship.—A $500 scholarship, established in 1896 by Mrs. Maria M. Carter in memory of her husband, Henry Harding Carter. Available to a deserving student who is preparing for the civil engineering profession.

School of Engineering Scholarships.—Four scholarships are available each year in the School of Engineering to graduates of accredited secondary schools. The holders of these scholarships must carry a full program in the School of Engineering.

Each scholarship is a full-tuition scholarship but does not cover special fees. Each scholarship is for four academic years (summer work is not to be included), provided the holder thereof meets all academic and other standards of the University.

To retain a School of Engineering scholarship, an average of *B* and a satisfactory standard of deportment must be maintained. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean.

Henry Parsons Erwin Scholarship.—Established in 1955 by Mrs. Helen B. Erwin as a memorial to her husband, Henry Parsons Erwin, a former Trustee of the University. Available for a student in Engineering.

Norman B. Ames Memorial Award.—Established in 1960 in memory of Dr. Norman B. Ames by many of his friends and awarded annually to a member of the graduating class of the School of Engineering whose class standing is in the upper 25th percentile and who has an outstanding record for participation in extracurricular activities of the University.

Martin Mahler Prize in Materials Testing.—Established in 1953 by Martin Mahler consists of a one-year membership in the American Society for Testing Materials

and is awarded to the upper-division or graduate student in engineering who submits the best reports on tests in the Materials Laboratories course with preference given to prestressed concrete tests.

School of Engineering Distinguished Scholar.—The Faculty of the School of Engineering awards a certificate to the senior who graduates with the highest scholastic standing. In addition, the student's name is engraved on a plaque displayed in Tompkins Hall. One award is made each year.

Sigma Tau Prize.—Xi Chapter of Sigma Tau Fraternity offers annually a medal to be awarded to that member of the freshman class in the School of Engineering who maintains the highest scholastic standing in the work of the entire year.

Theta Tau Activities Plaque.—Gamma Beta Chapter of Theta Tau Fraternity offers annually the Deacon Ames Activities Award in the form of a plaque awarded to that member of the senior class who has the most outstanding record in activities in the School of Engineering during the entire period of his attendance.

Financial Aid

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than July first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

For information concerning full- and part-time employment, see "The Placement Office", page 12.

REGULATIONS

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

ATTENDANCE

A student cannot attend classes until registration is completed and fees due are paid. A student may be dropped from any course for undue absence.

A student suspended for any reason may not attend classes during the period of suspension.

The student is expected to attend every meeting of the course in which he is registered, fully prepared to carry on the work required. The student is held responsible for all work in the course, and all absences must be excused before pro-

vision will be made for him to make up the work missed. Excuses for absences from examinations which have been announced in advance can be obtained only by making written application to the instructor in charge of the course.

AMOUNT OF WORK

A full-time undergraduate student who is not on probation may take no more than 20 semester hours. A student employed more than 24 hours a week who is not on probation may take no more than 10 semester hours.

A student previously unemployed who accepts employment after registration must immediately report that fact to the Dean so that his schedule may be adjusted if necessary.

ADVISORY SYSTEM

The School of Engineering encourages a close Faculty-student relationship. Every entering undergraduate student is assigned a permanent Faculty adviser to assist him to orient himself in the engineering discipline. Faculty advisers counsel students on their programs of study, the achievement and maintenance of satisfactory scholastic performance, professional development, and extracurricular activity as part of the educational process. The adviser represents the student in all cases requiring Faculty action.

Students who have not satisfactorily completed 70 semester hours must obtain their advisers' approval of programs of study prior to registration.

Until a student has completed the work of the freshman and sophomore years he must follow the recommendations of his adviser in all academic matters. However, an adviser may not deny a student entry into any course or activity to which he is entitled under the regulations of the School. Students having junior or senior status are encouraged to consult their advisers. The Dean acts as temporary adviser to entering or transfer students pending assignment of their permanent advisers.

All students are encouraged to discuss college problems with their advisers or instructors at any time; and parents or guardians are invited to consult with the Dean and advisers, concerning any student problems.

Faculty advisers discharge their counseling duties in accordance with the high principles of their professional responsibility; however, the final responsibility for a student's action lies wholly with the student.

SCHOLARSHIP REQUIREMENTS

A student must maintain a quality-point index of at least 2.00 to be in good academic standing.

A student who fails to maintain the scholarship requirements of the School of Engineering may be suspended from the University.

Grades

Grades are not given out by instructors but are mailed to the student through the Office of the Registrar at the close of each semester. Upon request, a copy of the student's grades will be forwarded to his parent or guardian.

The following undergraduate grading system is used: excellent, *A;* good, *B;* average, *C;* passing, *D;* failing, *F.* Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given to the in-

structor for the student's failure to complete the required work of the course. An "incomplete" can not be made up after the lapse of one calendar year except by permission of the Faculty. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. No student may repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental executive officer.

For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory). The grade *S* signifies a high level of scholastic achievement.

Quality-Point Index

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered.

Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete collegiate record. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not replaced by a proper grade within the allotted time, it is computed as zero quality points.

Grades in courses taken at another institution or taken to satisfy entrance requirements are not included in the quality-point index.

Scholarship*

Undergraduate

In order to graduate, a student must have a quality-point index of at least 2.00 in all work taken at this University and accepted in the School of Engineering.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors report to the Dean the names of students whose scholarship is unsatisfactory. On receipt of a warning notice the student must consult his instructor and his adviser immediately.

The adviser may prescribe diagnostic tests and/or remedial study to be completed before the end of the current semester.

Probation.—A student whose quality-point index falls below 2.00 is placed on probation. This probation extends over the period in which the student attempts 12 semester hours of study.

A student on probation may be required to follow a program of study, including remedial studies, prescribed by the Committee on Scholarship. He may not hold office, participate in the activities of any student organization, or represent the School in any student activity.

Suspension.—A student whose quality-point index is below 2.00 at the end of his probationary period is suspended. A student whose index falls below 2.00 after removal from probation is suspended.

At the time of his suspension a student may apply to the Committee on Scholarship for guidance concerning remedial action he should take during the period of his suspension.

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* For graduate scholarship requirements, see page 36.

A student suspended for poor scholarship may apply* to be readmitted in the semester or summer session which begins next after an interval of one calendar year. To be considered for readmission he must pass prescribed tests. A student readmitted after suspension is on probation. He must maintain a current quality-point index of at least 2.50 on each 12 semester hours of work undertaken until his cumulative index is 2.00. In no case will the probationary period after readmission exceed 24 hours of study. A student suspended twice for poor scholarship will not be readmitted.

Academic Dishonesty

Evidence of dishonesty on the part of any student will result in his suspension by the Dean upon the recommendation of the Dean's Council.

A student found guilty of dishonesty will be suspended for a stated period and will be deprived of credit for *all courses* in which he is enrolled during the semester in which the dishonest act occurs. A disciplinary grade of "Failure—Academic Dishonesty" will be recorded for each such course, and this grade will be employed in computation of the quality-point index.

If a student suspended for academic dishonesty should be readmitted, he may be required to repeat for grade all courses for which a disciplinary grade has been recorded, and both the grade earned on repetition and the disciplinary "Failure—Academic Dishonesty" grade will be employed in computation of the quality-point index.

A student may apply to be readmitted in the semester or summer session which begins next after an interval of one year from the date of suspension.

CHANGES IN PROGRAM OF STUDIES

After the registration period a student may not make any changes in his registration without the approval of the Dean. Requests for chances in registration must be made on forms provided in the Office of the School of Engineering.

Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Application for such change must be made on the proper form, obtainable in the Office of the Director of Admissions, where it should be filed.

During the seven days following the first day of classes of a semester, additional courses may be added to the student's program with the approval of the instructor, the student's adviser, and the Dean.

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Unauthorized withdrawal from a course at any time entails a penalty of failure in the course and financial responsibility for the full fee for the course. Permission to withdraw from the University will not be granted a student who does not have a clear financial record.

Withdrawal from any course without academic penalty after the fourteenth day following the first day of classes of a semester may be granted by the Dean under the following conditions: (1) exceptional circumstances make the request necessary; (2) the request is submitted on the official form for late withdrawals; (3) as of the date of request, the grades in all courses involved are *C* or better; and (4) approval of the Committee on Scholarship is obtained by the student.

In the exceptional circumstances mentioned above the Dean, upon recommendation of the Committee on Scholarship, may authorize withdrawal without academic

* Application for readmission should be made two months in advance to permit the taking and grading of readmission tests.

penalty. In all cases financial regulations governing withdrawals remain in full effect. (See pages 21 and 22.)

A graduate student may withdraw from a graduate course without academic penalty only within the first four weeks of a semester.

HONORS LIST

The Faculty of the School of Engineering recognizes meritorious scholastic achievement by an Honors List, containing in alphabetical order the names of candidates for undergraduate degrees in engineering, whose scholastic achievement satisfies all of the following requirements:

1. The candidate's cumulative quality-point index is equal to or exceeds 3.00.
2. At least 30 semester hours of credit have been earned while a degree candidate in the School of Engineering.
3. At least 15 (part-time student) or 30 (full-time student) semester hours of credit in an engineering degree curriculum have been earned in the two semesters immediately preceding the award.
4. No grade below *C* has been received during the qualifying period stated above.
5. No disciplinary action has been taken in respect to the student.

The Honors List is prepared at the end of the fall and spring semesters and displayed in an appropriate public place in the School of Engineering. A notation is made on the student's record each time his name is included in an Honors List.

CREDIT

Credit toward a degree is given only after registration for and satisfactory completion of the required work of classes or upon the granting of advanced standing in accordance with the regulations of the School. A student who takes a course as an auditor may not take the same course later for credit.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

Transcripts of Record

Official transcripts of student records will be issued on request of the student or former student. No charge is made for the first transcript; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a person who does not have a clear financial record.

Summer School Credit

A student who plans to attend summer school sessions at another institution and transfer credits so earned toward graduation from this University must first secure the written approval of the Dean. Transferred credits will not be recognized in excess of those which might be earned in a similar period in this institution.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean's Council. The Council may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean's Council.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirement of the School, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the certificate or degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—Application for a certificate or degree must be filed in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Curriculum.—Curriculum requirements for the Engineering Technologist Certificate are stated on page 42; for the Bachelor's degrees, on pages 32–34 and 42–43; for the Master's degrees, on pages 36–38.

Graduate Record Examination.—All candidates for Bachelor's degrees must take two parts of the Graduate Record Examination in the University's institutional testing program. The examinations are conducted by the University twice a year: the Fall Testing Session (December 8, 1962), for seniors graduating in February, and the Spring Session (April 6, 1963), for those graduating in June. Dates of the examinations are announced in the *Schedule of Classes.*

Each senior required to take the Graduate Record Examination must register for it in the Office of the Dean when he registers for his final regular semester of study (excluding summer sessions). A $10 examination fee is payable at the time of registration.

Students receive individual reports of test scores and may avail themselves of the transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

Residence.—For the Engineering Technologist Certificate, a minimum of 30 weeks and the last 36 semester hours must be completed in residence.

For the Bachelor's degrees, a minimum of 30 weeks and 36 semester hours must be completed in residence. Summer work may be counted. Unless special permission is granted by the Dean to study elsewhere, the work of the senior or final year must be completed in residence.

The graduate student must meet the residence requirements for the degree for which he is registered.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status by paying the appropriate fee, see page 20. For the purpose of this regulation the summer term will be disregarded.

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester immediately preceding the graduation at which he expects to receive his degree.

If a candidate for the degree of Doctor of Science fails to maintain his residence during a period of absence, he must reapply for admission to study under whatever new conditions and regulations are set up by his consultative committee.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for a Master's or Doctor's degree, respectively, must be presented

in its final form to the Dean no later than the date specified in the calendar. Three complete copies are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis or dissertation, which are rigidly enforced.

Accepted theses and dissertations with accompanying drawings become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in a thesis or dissertation must be secured from the Dean.

Presence at Graduation.—Presence at the graduation exercises is required of the candidate, unless the work for the degree was completed during the summer term or written application for graduation *in absentia* has been approved by the Dean.

Honors

With distinction.—A Bachelor's degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—A Bachelor's degree may be conferred with "Special honors", at the discretion of the Faculty, for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101–2 in the upper third of the students enrolled therein; (2) has a cumulative academic average of *B* or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself in leadership in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" may wear a "Distinguished Cadet" badge above the right breast pocket of the uniform. He may apply for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate".

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been a "Distinguished Air Force ROTC Cadet" in good standing during the period between designation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for the Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he applied, will be considered for a regular commission in the United States Air Force.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

Hours

The University Library is open from 9:00 A.M. to 10:00 P.M. each class day (Saturday 9:00 A.M. to 5:00 P.M.), and from 2:00 to 6:00 P.M. on Sunday.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

THE DEGREES

ENGINEERING TECHNOLOGIST CERTIFICATE

A two-year program of studies, leading to the Engineering Technologist Certificate, prepares the student to assume minor responsibilities in the field of measurement science. It is open to high school graduates who meet the requirements for admission stated on page 18.

THE BACHELOR'S DEGREES

The Bachelor's degrees are Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering.

The degree of Bachelor of Science in Engineering may be earned with any of the following options: Chemistry, Engineering Administration, Machine Computer, Mathematics, Measurement Science, or Physics.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, and Bachelor of Mechanical Engineering are accredited by

the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

CURRICULUM REQUIREMENTS

The satisfactory completion of one of the following curricula is required of all students registered for a Bachelor's degree in Engineering except those in the field of Measurement Science. For curricula leading to the Engineering Technologist Certificate and the degree of Bachelor of Science in Engineering with option in Measurement Science, see pages 42 and 43.

Variations from the prescribed curricula may be made, with the permission of the Dean's Council. A student desiring to omit a required course and substitute another must make written application to the Dean presenting satisfactory reasons for the substitution; written approval must be obtained before registration for the course.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status, see pages 20 and 29.

	Freshman Year*	Semester Hours
†Eng. 1 or 1X, 2	English Composition	6
‡Math. 21, 22, 23, 24 or Math. 27, 28	Calculus I, II, III, IV	12
ME 9	Introduction to Engineering	3
ME 10	Graphical Communication	2
Phys. 11	Introductory Physics	3
Phys. 14	General Physics	3
	Total	29

ROTC.—Air Force ROTC students take Air Science 1–2 and 22 (4).

	Sophomore Year	Semester Hours
Chem. 13–14	General Chemistry	8
CE 21	Rigid Body Mechanics I	3
CE 24	Mechanics of Deformable Bodies I	3
EE 11–12	Fundamentals of Electrical Engineering	6
Math. 111, 112	Mathematics for Engineers and Physicists I, II	6
Phys. 15, 16	General Physics	6
Elective	In humanities or social studies (see page 57)	3
	Total	35

ROTC.—Air Force ROTC students substitute Air Science 11–12 and 51 (4) for Elective (3).

BACHELOR OF CIVIL ENGINEERING

	Junior Year	Semester Hours
CE 112	Surveying	3
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3

* Exceptional students may qualify for admission to advanced courses by successfully completing qualifying examinations.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared for English 1 are assigned to English 1X.

‡ Students who started to meet the freshman-year mathematics requirement with the sequence of Mathematics 12, 29, 30, 31 should continue in that sequence. They should note, however, the terminal semesters for the offering of these courses.

CE 143–44	Structural Theory I–II	8
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
Elective	In humanities or social studies (see page 57)	10
	Total	37

SENIOR YEAR

		Semester Hours
CE 128	Soil Mechanics	3
CE 135	Hydraulic Engineering	3
CE 137	Applied Earth Sciences	3
CE 145	Metal Structures	3
CE 146	Reinforced Concrete	3
CE 154	Structural Dynamics	3
CE 157	Mechanics of Deformable Bodies II	3
CE 165	Engineering Analysis and Planning	3
CE 168	Regional and Urban Planning	3
Elective	In humanities or social studies (see page 57)	6
*Elective	Technical Electives	6
	Total	39

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF ELECTRICAL ENGINEERING

JUNIOR YEAR

		Semester Hours
CE 121	Rigid Body Mechanics II	3
EE 102	Engineering Electronics I	3
EE 103	Electric and Magnetic Fields	3
EE 104	Field Analysis	3
EE 107	Steady-state Network Analysis	3
EE 111	Electrical Measurements	3
EE 113	Electrical Engineering Laboratory I	2
EE 122	Electrical Engineering Laboratory II	2
EE 127	General Network Analysis	3
EE 134	Engineering Electronics II	3
Phys. 116	Quantum and Solid State Physics	3
Elective	In humanities or social studies (see page 57)	6
	Total	37

SENIOR YEAR

		Semester Hours
CE 132	Fluid Mechanics	3
EE 118	Electrical Energy Conversion	3
EE 123–24	Electrical Engineering Laboratory III–IV	4
EE 136	Electromagnetic Waves	3
EE 137	Active Network Theory	3
EE 171	Digital Circuitry and Systems	3
ME 113	Thermodynamics I	3
Elective	In humanities or social studies (see page 57)	8
†Elective	Technical Electives	9
	Total	39

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

* B.C.E. candidates elect any courses numbered from 100 to 300 in the sciences or engineering offered at this University.

† B.E.E. candidates elect from EE 133, 142, 172, or ES 154.

BACHELOR OF MECHANICAL ENGINEERING

Junior Year

		Semester Hours
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics I	3
ME 100	Analytical Kinematics	3
ME 113, 114	Thermodynamics I, II	6
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics	3
Phys. 191	Nuclear Reactors	3
Elective	In humanities or social studies (see page 57)	5
	Total	39

Senior Year

		Semester Hours
CE 157	Mechanics of Deformable Bodies II	3
ME 123, 124	Advanced Dynamics I, II	6
ME 135–36	Thermal Power	6
ME 139	Fluid Machinery	3
ME 143	Production Analysis	3
ME 146	Dynamics of Compressible Fluids	3
ES 154	Automatic Control	4
Elective	In humanities or social studies (see page 57)	9
	Total	37

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF SCIENCE IN ENGINEERING

Junior and Senior Years (Except for Measurement Science)

		Semester Hours
CE 121	Rigid Body Mechanics II	3
CE 125	Engineering Materials	4
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics I	3
EE 103	Electric and Magnetic Fields	3
ME 100	Analytical Kinematics	3
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
ME 120	Physical Metallurgy	3
Phys. 116	Quantum and Solid State Physics	3
	Total of Required courses	31
Option	As approved by the Department of Option and by the Dean	30
Elective	In humanities or social studies (see page 57)	15
	Total	76

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective (3) and option course (3).

The Bachelor of Science in Engineering curriculum provides training in the basic physical principles employed in engineering and in engineering methods of analysis.

and in addition, offers an opportunity for study in an optional field in which the student has special interest.

Optional studies can be selected from one or (occasionally) more of the fields of Chemistry, Engineering Administration, Machine Computer, Mathematics, Measurement Science,* or Physics. The program of study in the option is formulated by the department concerned in conference with the student. The program, bearing the approval of the Executive Officer of the department concerned, must be submitted by the student to the Dean before the beginning of the junior year.

THE MASTER'S DEGREES

Upon satisfactory completion of appropriate graduate requirements, the degree of Master of Science in Engineering or Master of Engineering Administration is conferred.

Study for the Master's degree is based upon a faculty-student relationship in which the ability and needs of the individual student are important elements in determining the curriculum. Programs are not restricted to one department or to a single field or type of study. They may include special instruction by assigned members of the engineering faculty or approved courses offered in other colleges and schools of the University. The Committee on Graduate Studies is responsible for establishing each student's program and for providing for its direction.

ADMISSION TO GRADUATE STUDY

For admission to graduate study the student must have a Bachelor's degree from a recognized institution and he must satisfy the Committee on Graduate Studies of his capacity for productive work in the field selected.

Applicants who have significant deficiencies in their preparation may qualify for admission to graduate study by taking prescribed undergraduate courses.

In some cases such study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

ADMISSION TO DEGREE CANDIDACY

Admission to graduate study does not constitute admission to degree candidacy. Specific requirements for admission to degree candidacy are stated under the headings of the appropriate degrees.

ADVANCED STANDING

Graduate courses completed before admission are not transferable for degree credit. The Committee on Graduate Studies may, however, consider them in planning individual programs. Course work to satisfy requirements for another degree granted by the University may not be used again to satisfy requirements for a Master's degree in the School of Engineering.

REQUIREMENTS FOR THE DEGREES

Residence

The candidate for a Master's degree must complete a minimum of one year of full-time study, or the equivalent in part-time study, under the direction of the Committee on Graduate Studies. A full-time student must complete all requirements for the degree within three years; a part-time student, within five years.

* The curriculum in Measurement Science is stated on pages 42 and 43.

Scholarship

A minimum grade of "Satisfactory" is required in all courses. A student who makes one grade of "Unsatisfactory" may repeat the course once, or he may appeal to the Committee on Graduate Studies for guidance. A student who receives two or more grades of "Unsatisfactory" will not be permitted to enroll further in the School of Engineering until he demonstrates by examination, or as the Committee may direct, that his deficiencies in course work have been removed. A grade of *B* or better is required for undergraduate courses taken to remove deficiencies in preparation for graduate study.

Master's Thesis

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, and to furnish objective evidence of constructive power in a given field. Work of a suitable character for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

Comprehensive Examination

To demonstrate substantial understanding of principles and methods of their use in the area of his interest, the student must pass a comprehensive examination, written, oral, or both, as prescribed by the Committee on Graduate Studies. This examination will not be taken until the candidate has successfully completed the prescribed program of study and submitted an acceptable Master's thesis.

THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING

The objective of this discipline is a substantial comprehension of scientific principles and methods for their use, as applied in modern engineering. Increased understanding of engineering science and its use in solving engineering problems are sought, rather than a breadth of familiarity with applications and techniques.

A program of study consisting of at least 24 semester hours of graduate courses to prepare the candidate for his comprehensive examination and a written Master's thesis (6 semester hours) is formulated, with particular attention to the individual student's needs and objectives. The program may provide for broad coverage in a variety of fields or may be designed to give some degree of specialization in a particular area, as determined by conference with the Committee at the time of admission to candidacy.

The level of the courses ordinarily requires as prerequisite the satisfactory completion of at least one undergraduate course in mathematics beyond the first course in ordinary differential equations and at least one in the area of the graduate course to be undertaken.

Admission to Degree Candidacy

Application for admission to degree candidacy must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must: (1) have completed satisfactorily all prescribed prerequisite study, (2) have satisfactorily completed a graduate course in each of two different subjects designated as Engineering Science, and (3) give evidence of satisfactory personal and intellectual qualifications.

Required Courses

Upon admission to graduate study, two courses designated as Engineering Science must be taken prior to application for admission to degree candidacy. Additional courses must be chosen from the areas of fundamental engineering study listed below.

Automatic Control	Fluid Dynamics
Elasticity	Structural Theory
Electric Networks	Thermodynamics
Electromagnetic Fields	Transients

Graduate courses in the basic areas of mathematics, physics, or chemistry may be substituted for these additional courses with the approval of the Committee.

Program of Study

Upon admission to candidacy for the degree, the remainder of the program is formulated by the student and his adviser. Major emphasis is usually given to study in fundamental and applied areas of engineering, mathematics, or science. The program may, however, include study in any areas which are characterized by a scientific discipline.

THE DEGREE OF MASTER OF ENGINEERING ADMINISTRATION

The objective of this discipline is to develop an understanding of the principles and a competence in the practices of administration as applied to engineering and scientific activities. Knowledge and understanding are sought rather than mere familiarity with techniques.

A study program is prescribed for each candidate, in accordance with his preparation and objective, by the Committee on Graduate Studies or an assigned adviser. Programs are integrated sequences of courses.

The degree of Master of Engineering Administration is granted upon the successful completion of (1) 30 semester hours of graduate courses, including the written Master's thesis, and (2) the Comprehensive Examination.

Prerequisite to Admission to Graduate Study

In addition to the requirements for admission to graduate study stated on page 35, the applicant must have an adequate knowledge of the principles of human relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by the successful completion of the following undergraduate courses or an approved equivalent: Psychology 145 *Principles of Human Relations*, Accounting 115 *Survey of Accounting*, and Statistics 107 *Statistics for Engineers*.

Admission to Degree Candidacy

Application for admission to degree candidacy must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must: (1) have completed satisfactorily all prescribed prerequisite study; (2) have satisfactorily completed courses EA 201 *Engineering Administration I*, EA 202 *Engineering Administration II*, and EA 271 *Operations Research;* and (3) give evidence of satisfactory personal and intellectual qualifications.

Program of Study

The content of the courses immediately following is considered essential knowledge for every candidate for the degree of Master of Engineering Administration. The candidate is required to complete all of the courses except those in which he (1) has successfully completed graduate study or (2) can demonstrate to the Committee on Graduate Studies an acceptable knowledge of the course field.

		Semester Hours
EA 201	Engineering Administration I	3
EA 202	Engineering Administration II	3
EA 271	Operations Research	3
EA 299–300	Master's Thesis	6

The following courses provide knowledge in certain special areas which are significant in engineering administration. The candidate is required to select at least two; it is preferable that he elect three.

		Semester Hours
EA 206	Human Relations in Administration	3
EA 251	Management of Research and Development	3
EA 252	Production and Maintenance Management	3
Stat. 262	Managerial Statistics and Quality Control	3

Elective

Courses are to be elected to provide a total of 30 semester hours for the program.

		Semester Hours
EA 261	Economic Analysis in Engineering Planning	3
EA 263	Quantitative Techniques of Engineering Administration	3
EA 272	Problems in Operations Research	3
EA 273–74	Techniques of Operations Research	6
EA 285	Seminar in Engineering Administrative Problems	3
EA 295	Applied Research in Engineering Administration (arr.)	
EA 296	Research in Engineering Administration (arr.)	
Acct. 215	Survey of Managerial Accounting	3
Acct. 293	Budget Preparation and Administration	3
Bus. Adm. 250	Contract Administration	3
Pub. Adm. 213	Administration in Government	3
Stat. 271–72	Statistical Information Theory	6
Elective	(To be selected from Engineering or the sciences), as approved by the Committee on Graduate Studies	3–6

THE DOCTORAL PROGRAM

Introductory

The School of Engineering offers a program of advanced study and research leading to the degree of Doctor of Science. This program is limited to recognized engineering fields in which a scientific discipline exists and for which the University has adequate resources.

The Doctoral discipline is designed to prepare the student for a career of creative scholarship by providing a broad background of knowledge and an understanding of research methods. It requires study of interrelated fields of learning as well as original research in the engineering field of central interest.

The discipline for the degree is divided into two stages. The first—made up of a study of interrelated fields of learning which support the general area of research concentration—culminates in the qualifying examination. The second—composed

of research investigation of a particular subject in a special field and the presentation of such research findings in a written dissertation—culminates in the final examination.

Detailed information on the program is provided in a separate publication obtainable on request.

Admission

The applicant must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

Language Requirements

A reading knowledge is required of two foreign languages important in the student's field of interest. One language examination must be passed before admission to graduate study. The second must be passed before admission to the qualifying examination and within one year of the start of study for the qualifying examination.

Application for Admission

Well in advance of the opening of the semester for which the student seeks admission, he must have a personal interview with the Chairman of the Committee on Graduate Studies or the professor under whom he wishes to study, to discuss the field of study, the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities of an effective doctoral program. If an application for admission is indicated, the student will be advised concerning the details of application procedure.

Study for the Qualifying Examination

Upon admission to study for the qualifying examination the student's admission committee becomes his Consultative Committee, which prescribes and directs his studies. The Committee assigns to him a group of fields of learning deemed necessary to insure his breadth of knowledge, as well as to support research in his central field. Members of the Committee advise the student concerning the scope and content of these fields of study, which are generally more inclusive and intensive than courses of instruction announced in the University catalogue, and will guide him in preparation for his examination in them.

The purpose of the qualifying examination is to ascertain that the student's breadth of background and intellectual development are adequate to support doctoral research and investigation in his central field. The qualifying examination is both written and oral and usually extends over a period of six days. It is given by a special committee consisting of members of the student's Consultative Committee and other scholars. Upon favorable report of the examiners to the Committee on Graduate Studies the student is admitted to candidacy for the degree, to pursue his specialized study and research under the supervision of a designated member of the Faculty.

The examination is the sole test of the student's ability to qualify for admission as a candidate for the degree, and to enter the second stage of his doctoral discipline.

Research, the Dissertation, and the Final Examination

The student admitted to candidacy for the degree requests as Master in Research the member of the Faculty under whom he wishes to pursue research and specialized study. The Faculty member may accept or reject such request. The research is arranged by the Master and approved by the Committee on Graduate Studies. Throughout the remainder of the doctoral program, the candidate is responsible solely to his Master in his research and in the presentation of his dissertation.

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results. Upon approval of the dissertation (see pages 29–30) by the Master, the candidate is presented for his final examination. The summaries of accepted dissertations are printed in a numbered issue of the University Bulletin. The successful candidate is required before receiving his degree to pay a fee to cover the expense of the printing of the summary of his dissertation.

The final examination is oral and is open to the public. The candidate must demonstrate a mastery of his special field of interest and of the materials and techniques used in the research. The committee of examiners includes members of the Committee on Graduate Studies competent in the research field or in closely related subjects and may also include qualified experts brought to the University especially to participate in the examination. If the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Committee on Graduate Studies recommends him for the degree of Doctor of Science.

Residence and Continuous Study

All of the work for the degree must be done in residence (on the campus), except in certain circumstances when the student may be permitted to undertake a portion of the research problem in an approved off-campus facility. The student must maintain continuous registration in the School of Engineering, even when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student, and he must apply for readmission to graduate study under whatever new conditions and regulations are set up by his consultative committee.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the qualifying examination or as a candidate engaged in doctoral research. The qualifying examination, however, must be completed within five years of the date of admission, and the entire degree program must be completed within seven years. After admission the student may apply for his qualifying examination whenever his consultative committee believes that he is prepared to take it; his research and specialized study may be undertaken with whatever concentration of time meets the approval of his research adviser. Normally a minimum of two years of full-time study and research is spent in meeting the requirement for the degree.

THE CENTER FOR MEASUREMENT SCIENCE

The Center, under the direction of the School of Engineering, is a cooperative activity of the University, industry, and government providing education, research, and service programs related to measurement. It was established by the University in 1960, with the collaboration of the National Bureau of Standards and the financial support of a grant from The Martin Company of Baltimore, Maryland.

The principal, but not exclusive, activities of the Center are:

The education of persons for careers in measurement science;

The development and improvement of measurement, standardization, and calibration techniques, apparatus, and data—with particular reference to high precision.

The provision of staff and facilities available to industry for research and consultation on measurement problems in industry, and including the maintenance of primary standards of measurement directly traceable to the national standards.

The publication of results of research, manuals of practice and procedures, and information related to measurement science.

The Center maintains relations with industry and government through its Associate Program, in which interested individuals, companies, or other organizations may participate. The mutual communication, collaboration, and support made possible by this program bring vitality to the Center activities and insure attention to the needs of industry and government.

Through these and other activities the Center serves as a source of personnel competent in measurement science, as an instrument for collaborative research on measurement problems, and as a service organization providing expert capability to industrial and government organizations in the solution of their measurement problems.

The Education Program

The Education Program of the Center consists in part of four curricula offered by the School of Engineering, which prepare the student to assume responsibilities in the field of measurement science. The curricula are integrated, to permit a student to terminate his formal education at any level, or to proceed to the next level. Programs lead to the Engineering Technologist Certificate and the degrees of Bachelor of Science in Engineering, Master of Science in Engineering, and Doctor of Science.

In addition to the certificate and degree programs, the education program includes seminars, special conferences, and short courses offered from time to time.

The Research Program

The research program of the Center includes all aspects of research and development related to measurement science. Research and/or development may be undertaken as independent studies by staff members for the Center, as studies for a sponsor under contract, or by personnel of Associates of the Center assigned to the Center to undertake the specific work. Associates receive publications of the Center; certain publications may be restricted in distribution.

The Service Program

The Service Program of the Center provides a mechanism for obtaining consultation and assistance of the faculty, staff, and facilities of the Center in connection with specific problems in measurement. The program is restricted to the use of the Associates of the Center.

Additionally the Service Program makes it possible for Associates to engage the various resources of the University, through the Center, as may be desirable and feasible, in solution of their problems in measurement.

For complete information concerning the Center for Measurement Science, see the bulletin, which is available upon request to the Director of the Center for Measurement Science, Tompkins Hall, 725 Twenty-third Street, NW., Washington 7, D. C., FEderal 8-0250, Extension 246.

ENGINEERING TECHNOLOGIST CERTIFICATE

This is a two-year program open to high school graduates who meet the requirements for admission stated on page 18.

Regulations governing students enrolled in the Engineering Technologist program are stated on pages 24–31.

CURRICULUM

First Year

		Semester Hours
Chem. 13–14	General Chemistry	8
Engl. 1 or 1X	English Composition	3
*Math. 21, 22, 23, 24 or Math. 27, 28	Calculus I, II, III, IV	12
Physics 11	Introductory Physics	3
Physics 14	General Physics	3
ME 9	Introduction to Engineering	2
ME 10	Graphical Communication	3
	Total	34

Second Year

CE 21	Rigid Body Mechanics I	3
CE 24	Mechanics of Deformable Bodies I	3
CE 121	Rigid Body Mechanics II	3
EE 11–12	Fundamentals of Electrical Engineering	6
Math. 111	Mathematics for Engineers and Physicists I	3
Metr. 5	Foundations of Metrology I	5
†Metr. 6	Foundations of Metrology II	4
Metr. 4	Introduction to Statistics for Metrology	3
Physics 15, 16	General Physics	6
	Total	36

* Students who started to meet the freshman-year mathematics requirement with the sequence of Mathematics 12, 29, 30, 31 should continue in that sequence. They should note, however, the terminal semesters for the offering of these courses.

† Students intending to continue study toward the degree of Bachelor of Science in Engineering should substitute Mathematics 112 for Metrology 6 and English 2 for CE 121.

BACHELOR OF SCIENCE IN ENGINEERING

Measurement Science Option

Regulations governing students enrolled in this program are stated on pages 24–31.

CURRICULUM

The curriculum for the first two years is the same as that stated above, for the Engineering Technologist Certificate. (See footnote on page 42.)

Junior Year

		Semester Hours
CE 121	Rigid Body Mechanics II	3
CE 132	Fluid Mechanics	3
EE 102	Engineering Electronics I	3
EE 103	Electric and Magnetic Fields	3
EE 104	Field Analysis	3
ME 113	Thermodynamics I	3
ME 118	Heat Transfer	3
Metr. 6	Foundations of Metrology II	4
Metr. 113	Introduction to Transducers and Instrumentation	2
Elective	In humanities or social studies	9
	Total	36

Senior Year

CE 125	Engineering Materials	4
ME 100	Analytical Kinematics	3
ME 120	Physical Metallurgy	3
Metr. 111–12	Precise Electrical Measurements I, II	6
Metr. 114	Advanced Transducers and Instrumentation	3
Metr. 121	Precise Mechanical Measurements	4
Metr. 131	Precise Heat Measurements	4
Physics 116	Quantum and Solid State Physics	3
Elective	In humanities or social studies	5
	Total	35

GRADUATE DEGREES

Graduate programs in Measurement Science are offered, which lead to the degrees of Master of Science in Engineering (see pages 35–37) and Doctor of Science (see pages 38–40).

COURSES OF INSTRUCTION

On the following pages, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered in the School of Engineering. Also listed are courses offered by other schools and colleges of the University, but required or accepted as electives for the degrees in engineering. The courses as here listed are subject to some slight change. Students are referred to the *Schedule of Classes*, which is available prior to the opening of each semester, for the hourly scheduling of all courses of instruction.

The University reserves the right to withdraw any course announced.

Explanation of Course Numbers

The following system of numbering is used to identify courses.

Undergraduate courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. Courses numbered from 101 to 200 are planned for students in the junior and senior years.

Graduate courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the Chairman of the Committee on Graduate Studies and the Dean, to qualified seniors.

Indication of the Amount of Credit

The number of semester hours given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving three hours of credit each semester is marked (3–3), and a semester course giving three hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ENGINEERING

UNDERGRADUATE COURSES

Civil Engineering

21 *Rigid Body Mechanics I* (3)

Fall—day and evening; spring—evening. An introduction to vector mechanics. Newton's Laws; equilibrium of a particle and systems of particles, rigid bodies, and systems of rigid bodies; kinematics. Prerequisite: Mathematics 31 or 24, Physics 14.

24 *Mechanics of Deformable Bodies I* (3)

Fall—evening; spring—day and evening. An introduction to elastic and inelastic behavior of solids acted upon by forces. Analysis of stress and strain at a point; stress-strain temperature relations; criteria for yielding; applications including tension, compression, torsion, bending, shear, and buckling. Prerequisite: Civil Engineering 21, Mathematics 31 or 24.

112 *Surveying* (3)

Spring: lecture (2 hours), field work (2 hours)—Saturday. Plane surveying, including measurements, simple curves, and topographical surveying; space measurements; treatment of observational errors; earthwork computations; field astronomy. Prerequisite: Mathematics 31 or 24, Mechanical Engineering 10. Surveying fee, $13.

121 *Rigid Body Mechanics II* (3)

Fall—day and evening; spring—evening. Continuation of Civil Engineering 21. Kinematics and dynamics of a particle, systems of particles, and rigid bodies and their applications. Prerequisite: Civil Engineering 21, Mathematics 111.

125 *Engineering Materials* (4)

Fall: lecture and laboratory—day and evening. Mechanical and surface properties of engineering solids; relationships between the structure of a material and its mechanical and physical behavior; principles of the control of the properties of metals and nonmetallic solids. Prerequisite: Chemistry 12 or 14. Civil Engineering 24, Physics 16. Laboratory fee, $11.

128 *Soil Mechanics* (3)

1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Mechanical properties of soils; theory and applications of lateral earth pressure, bearing capacity, and settlement of foundations. Prerequisite: Civil Engineering 125, 137, 144.

132 *Fluid Mechanics* (3)

Fall: lecture and laboratory—evening; spring: lecture and laboratory—day and evening. Development of the fundamental principles of flow of viscous and ideal compressible and incompressible fluids; dimensional analysis and model theory; laboratory work emphasizes principles, analysis of tests, and systematic observations of phenomena. Prerequisite: Civil Engineering 121, Mathematics 111, Mechanical Engineering 113. Laboratory fee, $11.

135 *Hydraulic Engineering* (3)

1962–63 and alternate years: spring—day; 1963–64 and alternate years; spring—evening. Applied fluid mechanics, pipe and open channel flow, hydroelectric development, drainage and irrigation, control of river flow and floods, water supply and sewerage. Prerequisite: Civil Engineering 137.

137 *Applied Earth Sciences* (3)

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Formation and properties of soils and rock, seismology, climatology, hydrology, ground water and river flow. Prerequisite: Civil Engineering 125, 132.

143–44 *Structural Theory I–II* (4–4)

1962–63 and alternate years: academic year—day; 1963–64 and alternate years: academic year—evening. Theory and structural behavior of statically determinate and indeterminate plane and space structures by classical and modern methods; included are model analysis, plastic collapse, numerical methods, and matrix algebra methods. Prerequisite or concurrent registration: Civil Engineering 125, Mathematics 111. Laboratory fee, $11 a semester.

145 *Metal Structures* (3)

1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Application of structural theory and engineering materials to the analysis and design of metal structures under static and moving loads; plastic design, buckling. Prerequisite: Civil Engineering 144, 157.

146 *Reinforced Concrete* (3)

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Theory and design of plain and reinforced concrete structures including prestressed concrete and ultimate strength design. Prerequisite or concurrent registration: Civil Engineering 157.

154 *Structural Dynamics* (3)

Spring—day. Free, forced, steady-state, and transient vibration of structural members and framed structures; earthquake, blast, and other dynamic loadings; methods of analysis including energy methods and applications of matrix algebra. Prerequisite: Civil Engineering 121, 144, Mathematics 111.

157 *Mechanics of Deformable Bodies II* (3)

Fall—day. An introduction to the advanced mechanics of deformable bodies including the theory of two-dimensional linear elasticity in cartesian and polar coordi-

nates and the theory of perfectly plastic solids. Prerequisite: Civil Engineering 125, Mathematics 112. Prerequisite or concurrent registration: Civil Engineering 144 or Mechanical Engineering 123.

165 *Engineering Analysis and Planning* (3)
1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Mathematical analysis, planning, and economics of engineering problems and projects including modern computational methods. Prerequisite: senior standing in Civil Engineering.

166 *Transportation Engineering* (3)
Time to be arranged. Planning and systems analysis of transportation networks. Prerequisite: Civil Engineering 165.

168 *Regional and Urban Planning* (3)
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Regional and urban planning including engineering aspects in connection with transportation, water supply and sewerage, public safety, and convenience. Prerequisite: Civil Engineering 165.

195–96 *Problems in Civil Engineering* (arr.)
Academic year—as arranged. Special problems approved by the Staff. Prerequisite: senior standing.

Electrical Engineering

11–12 *Fundamentals of Electrical Engineering* (3–3)
Academic year—day and evening. Electric and magnetic fields, d-c and a-c electrical circuits and networks, energy sources, electromechanical energy conversion, power, electronic devices, and circuits. *First half:* circuits and electronics. *Second half:* energy, power, and fields. Prerequisite to Electrical Engineering 11: Physics 15 and Mathematics 111 or concurrent registration. Prerequisite to Electrical Engineering 12: Electrical Engineering 11.

102 *Engineering Electronics I* (3)
Fall—day and evening. Vacuum tube and solid state devices as circuit elements, equivalent circuits, voltage and power amplifiers. Emphasis placed on design of electronic circuits. Prerequisite: Electrical Engineering 12, Mathematics 112.

103 *Electric and Magnetic Fields* (3)
Fall—day and evening. Introduction to vector analysis and its application to static electric and magnetic fields; method of images, solid angle, particle motion in electric and magnetic fields. Prerequisite: Electrical Engineering 12, Mathematics 112.

104 *Field Analysis* (3)
Spring—day and evening. Vector potential, magnetic scalar potential, conformal mapping, solutions of Laplace's equation, field plotting, analogues. Introduction to Maxwell's equations and electromagnetic waves. Prerequisite: Electrical Engineering 103, Mathematics 112.

107 *Steady-state Network Analysis* (3)
Fall—day and evening. Four-terminal networks, network theorems, poles and zeroes of network functions, resonance, filters, coupled circuits, transmission lines. Fourier series, matrices. Prerequisite: Electrical Engineering 11, Mathematics 112.

111 *Electrical Measurements* (3)
Fall—day and evening. Systems of units; theory of errors; d-c indicating instruments and galvanometer dynamics; precision measurement of voltage, current, and resistance. Theory of a-c indicating instruments, a-c bridges, waveforms, frequency measurements, measurement of power and energy. Prerequisite: Electrical Engineering 12, Mathematics 112.

113 *Electrical Engineering Laboratory I* (2)
Fall—day and evening. Experiments in d-c and a-c circuits, instruments, and machines. Prerequisite: Electrical Engineering 12, Mathematics 112. Laboratory fee, $11.

118 *Electrical Energy Conversion* (3)

Spring—day and evening. Analysis of physical systems involving electrical, mechanical, and thermal energy conversion; mathematical formulations using the Euler-Lagrange equation; transient and steady-state analysis of special machines including the generalized rotating energy converter. Prerequisite: Electrical Engineering 12, Mathematics 112. Prerequisite or concurrent registration: Electrical Engineering 104, 112.

122 *Electrical Engineering Laboratory II* (2)

Spring—day and evening. Continuation of Electrical Engineering 113. Measurement of electrical quantities, design and construction of laboratory circuits. Prerequisite: Electrical Engineering 102, 103, 107, 111, 113. Laboratory fee, $11.

123–24 *Electrical Engineering Laboratory III–IV* (2–2)

Academic year—day and evening. *First half:* theory and use of electronic devices and instruments. Experiments at radio- and microwave frequencies. Prerequisite to 123: Electrical Engineering 122 and senior status. *Second half:* Creative projects in electrical and elctromechanical devices and systems carried out under individual supervision. Prerequisite to 124: Electrical Engineering 123. Laboratory fee, $11 a semester.

127 *General Network Analysis* (3)

Fall—day and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeroes of network functions, correlation of time and frequency domains, elements of network synthesis. Prerequisite: Electrical Engineering 107, Mathematics 112.

133 *Engineering Analysis* (3)

Fall—day. Application of fundamental principles of engineering, physics, and mathematics to problems in various fields of engineering. Emphasis is placed on problem solving using concepts previously studied. Prerequisite: Civil Engineering 121, Electrical Engineering 102, Mathematics 112, Physics 16.

134 *Engineering Electronics II* (3)

Spring—day and evening. Continuation of Electrical Engineering 102. Feedback amplifiers, oscillators, relaxation circuits, computing circuits, modulation. Prerequisite: Electrical Engineering 102.

136 *Electromagnetic Waves* (3)

Spring—day and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices. Prerequisite: Electrical Engineering 104, Mathematics 112.

137 *Active Network Theory* (3)

Fall—day and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems. Prerequisite: Electrical Engineering 102 or Physics 132, Electrical Engineering 107, Mathematics 112.

142 *Information Theory* (3)

Spring—day and evening. Introduction to probability. Discrete and continuous information sources. Coding, transmission, channel capacity, correlation function. Noise in information systems. Prerequisites: Mathematics 112 and senior status.

171 *Digital Circuitry and Systems* (3)

Fall—day. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 134 or Physics 132.

172 *Digital Techniques* (3)

Spring—day. Continuation of Electrical Engineering 171. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams. Prerequisite: Electrical Engineering 171.

174 *Digital and Analog Computer Laboratory* (2)
Spring—day. Theory and use of digital and analog computers: programming, operating, logical circuitry, design, troubleshooting. Prerequisite: Electrical Engineering 134, 171. Laboratory fee, $11.

Mechanical Engineering

9 *Introduction to Engineering** (3)
Fall—day and evening; spring—evening. Number systems, computation aids, scientific method, problem solving techniques, use of mathematical tables. Emphasis is placed on the development of sound reasoning and study methods.

10 *Graphical Communication* (2)
Fall—evening; spring—day and evening. Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course. Laboratory fee, $10.

100 *Analytical Kinematics* (3)
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Theoretical study of the motion of constrained and unconstrained rigid bodies. Prerequisite or concurrent registration: Civil Engineering 121, Mathematics 112.

113 *Thermodynamics I* (3)
Fall—day and evening. Theoretical study of fundamental concepts, equations of state, first and second laws of thermodynamics, entropy, single and two-phase mixtures. Prerequisite: Chemistry 12 or 14, Mathematics 111, Physics 16

114 *Thermodynamics II* (3)
Spring—day. Theoretical study of vapor cycles, combustion, gas dynamics, equilibrium, multiphase mixtures. Prerequisite: Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132, Mechanical Engineering 118.

118 *Heat Transfer* (3)
Spring—day and evening. Heat transfer theory, conduction, convection, radiation, field and potential theory applied to conduction. Prerequisite: Mathematics 112, Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132.

120 *Physical Metallurgy* (3)
1962–63 and alternate years: spring—day; 1963–64 and alternate years: spring—evening. Physics of metals, crystal and lattice structures, binary and ternary alloys, properties of alloys, nonequilibrium conditions, phase diagrams. Lecture and laboratory. Prerequisite: Civil Engineering 125, Mathematics 31 or 24. Laboratory fee, $10.

123 *Advanced Dynamics I* (3)
1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. Shock and vibrations in linear mechanical systems, electromechanical analogies, transient and steady-state analysis. Prerequisite: Mechanical Engineering 100. Prerequisite or concurrent registration: Civil Engineering 157.

124 *Advanced Dynamics II* (3)
1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Advanced study of dynamics of continuous mechanical systems. Lagrange's equations, Hamilton's principle, gyrodynamics. Prerequisite: Mechanical Engineering 123.

135–36 *Thermal Power* (3–3)
1962–63 and alternate years: academic year—evening; 1963–64 and alternate years: academic year—day. Analysis and design principles governing systems and components in heat power, gas and vapor turbines, internal combustion engines, heat pumps, nuclear power systems. Lecture and laboratory. Prerequisite: Civil Engineering 132; Mechanical Engineering 114, 118; Physics 191. Prerequisite or concurrent registration: Mechanical Engineering 139. Laboratory fee, $15 a semester.

* This course should be completed before the beginning of the sophomore year.

139 *Fluid Machinery* (3)

1962–63 and alternate years: fall—evening; 1963–64 and alternate years: fall—day. General theory of dynamic machines: velocity diagrams and work transfer; radial, axial, and mixed-flow machines; torque converters and couplings; jet machines. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Prerequisite or concurrent registration: Mechanical Engineering 123. Laboratory fee, $10.

143 *Production Analysis* (3)

1962–63 and alternate years: fall—day; 1963–64 and alternate years: fall—evening. Principles of schematic models, mathematical programming, quality control, operations analysis. Prerequisite: Mathematics 112.

146 *Dynamics of Compressible Fluids* (3)

1962–63 and alternate years: spring—evening; 1963–64 and alternate years: spring—day. Mathematical theory of compressible fluid flow, flow around immersed bodies, airfoil theory, shock-wave theory, thermodynamics of compressible fluids. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 118. Laboratory fee, $10.

195–96 *Special Topics in Mechanical Engineering* (arr.)

Academic year—as arranged. Special problems approved by the Staff. May be substituted for required senior courses. Prerequisite: senior status and approval of the instructor.

Metrology*

1 *Introduction to Statistics for Metrology* (3)

Measurement—qualitative and quantitative aspects. The role of corrections. Measurement as a production process. Errors, limiting mean, true value, precision, and accuracy. Classification of errors; statistical tools for the detection and diagnosis of errors. Quality control of measurement processes. Measurement of the precision and assessment of the accuracy of a measurement process. Expression of the uncertainties affecting a measured value. Prerequisite: Mathematics 31 or 24, and a laboratory course in physical science or engineering.

5–6 *Foundations of Metrology I–II* (5–4) (NBS)

Origin and development of standards, relative and absolute measurements, systematic and random errors, comparison and dissemination of standards, effective design of experiments, translation of standards to manufacturing. Use of standard devices for measurement of length, time, speed, force, weight, mass, density, specific gravity; calibrations. Fluid flow and electrical measurements; measurements involving use of several instruments. Prerequisite: Mathematics 31 or 24, Physics 14.

111–12 *Precise Electrical Measurements I–II* (3–3) (NBS)

Electrical measurements from direct current through radio frequencies. Units and dimensional systems; techniques of substitution and comparison; transfer techniques; ratio techniques; detectors; bridges; measurement of current, voltage, power, resistance, capacitance, inductance, energy, phase angle, frequency, and time; dielectric and magnetic measurements; special topics in high-frequency measurements; field strength, signal-to-noise ratio, impedance, attenuation. Prerequisite: Electrical Engineering 102, 104, and Mathematics 111, or the equivalent.

113 *Introduction to Transducers and Instrumentation* (2)

Theory and application of simple transducers; techniques in instrumentation of systems of one type (electrical, electronic, fluid, mechanical, optical, acoustical, nuclear); analysis and design of simple instrumentation systems, with emphasis on the precision and accuracy of measurement. Prerequisite: Electrical Engineering 102, Mathematics 111, Metrology 6, or the equivalent.

114 *Advanced Transducers and Instrumentation* (3)

Advanced study of practical transducers and instrumentation; theory and applications of advanced transducers in instrumentation problems involving measurements on sys-

* NBS in parentheses indicates courses which will be taught at the National Bureau of Standards.

tems containing multiple quantities of one type or mixture of types (such as electrical, electrical-electronic, fluid, fluid-mechanical-acoustical, etc.), with emphasis on optimal instrumentation for precision measurement. Prerequisite: Metrology 113 or graduate status.

121 *Precise Mechanical Measurements* (4) (NBS)
Measurements of mass, time, weight; visual, mechanical, length, and interferometric methods; density, force, pressure, vibration, acceleration, flow, and viscosity measurements. Prerequisite: Metrology 4, 5, or the equivalent.

131 *Precise Heat Measurements* (4) (NBS)
Temperature measurement, the thermodynamic and international temperature scales; resistance thermometry, thermocouples, and pyrometry. Vapor pressure thermometry and other techniques for low-temperature measurement. Heat transfer quantities and their measurement, conduction, convection, and radiation. Calorimetry; isothermal and adiabatic calorimeters, flow calorimeters; types of heat quantities measured by calorimetry. Prerequisite: Metrology 4, 5, 111, or the equivalent.

GRADUATE COURSES

Prerequisites for graduate courses are not listed explicitly. Instructors in individual courses will state prerequisites, and may recommend preparatory work to be completed prior to admission to the course. (See also page 35.)

Engineering Administration

The School of Engineering offers the following courses primarily for candidates for the degree of Master of Engineering Administration. Other courses listed in this program are offered by the departments of Accounting, Business and Public Administration, Psychology, and Statistics.

201 *Engineering Administration I* (3)
Fall—evening; spring—evening. Application of scientific method to the administrative processes of (1) planning and (2) organizing; including development of objectives, key factors in planning, basics of organization, stages of organizational growth, special problems of organization in an engineering or scientific enterprise.

202 *Engineering Administration II* (3)
Fall—evening; spring—evening. Continuation of Engineering Administration 201. Application of scientific method to the administrative processes of (3) managing or directing and (4) evaluation and control. Study of delegation; decentralization; personnel relations; management development; systems engineering; automation; financial analysis, budgeting, and administrative audits.

206 *Human Relations in Administration* (3)
Fall—evening; spring—evening. The meaning, principles, and practices of management development and personnel relations; collective bargaining; principles and practices of personnel administration; professional social relations.

251 *Management of Research and Development* (3)
Fall—evening; spring—evening. Management problems involved in the administration of research and development programs; exploration of techniques in programming; the planning of research and development; selection of organizations for research, maintenance, control, and evaluation of projects.

252 *Production and Maintenance Management* (3)
Fall—evening; spring—evening. Planning, organizing, and managing of production and systems. Managerial implications of automation. Study of skills and abilities essential to industrial management, including maintenance of equipment and real property.

261 *Economic Analysis in Engineering Planning* (3)
Fall—evening; spring—evening. Application of economic principles to engineering administration: inputs, outputs, investments, and prices. Studies are made of the methods of analyzing economic factors in evaluating alternate courses of administrative action in government and industry.

263 *Quantitative Techniques of Engineering Administration* (3)
Spring—evening. Application of the various quantitative techniques, mathematical, statistical, and other management sciences' techniques to the analysis of engineering administration and the solution of administrative problems by the use of models, theories, and measurements.

271 *Operations Research* (3)
Fall—evening; spring—evening. Background and application of operations research; history, characteristics, capabilities, administrative considerations, cases, methods, and techniques, including construction of conceptual and mathematical models.

272 *Problems in Operations Research* (3)
Spring—evening. Illustrations of the application of operations research by study of case histories: examples of the formulation and preliminary order-of-magnitude case; examples of broader scope.

273–74 *Techniques of Operations Research* (3–3)
Academic year—evening. Theory and application of techniques used in operations research, including order-of-magnitude estimation, probability and mathematical statistics, symbolic logic, inequality-constrained stationary-value problems, dynamics of populations, Monte Carlo simulation, strategic gaming, and error and sensitivity analysis.

285 *Seminar in Engineering Administrative Problems* (3)
Fall—evening; spring—evening. Individual analysis of complex administrative problems, with group evaluation and discussion. Prerequisite: admission to candidacy and completion of at least 18 semester hours of graduate study.

295 *Applied Research in Engineering Administration* (arr.)
Fall—as arranged; spring—as arranged. Application of established principles to new engineering administrative situations; the development of new knowledge of administration.

296 *Research in Engineering Administration* (arr.)
Fall—as arranged; spring—as arranged. Creative thinking in engineering administration, initiation of new theories and principles, development of new hypotheses, experimentation, proof of theories and hypotheses.

299–300 *Thesis* (3–3)
Academic year—as arranged.

Engineering Science

The following courses serve as foundations for specialization, since they are concerned with a body of knowledge applicable in a variety of engineering fields.

130 *Introductory Astronomy* (3)
Spring—evening. Coordinate systems and nomenclature used in astronomy, description of astronomical systems from solar system to metagalaxies, introduction to celestial mechanics, types of stars, stellar physics. Prerequisites: integral calculus and one year of college physics.

154 *Automatic Control** (4)
Spring—day and evening. Theory of automatic control systems including electromechanical, pneumatic, and hydraulic systems. Transient analysis, transfer functions,

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

stability criteria. Experimental study of automatic control systems. Lecture and laboratory. Prerequisite: Electrical Engineering 127 or Mechanical Engineering 123. Laboratory fee, $11.

201 *Automatic Control* (3)
Fall—evening. Advanced theory of automatic control. Systems analysis, multiple-loop systems, nonlinear systems.

211 *Mathematical Methods in Engineering I* (3)
Fall—day and evening; spring—evening. A course in such topics as functions of complex variables, infinite series, linear vector spaces and matrices, and partial differential equations. The required level of preparation is equivalent to Mathematics 111 and 112 as given at this University.

212 *Mathematical Methods in Engineering II* (3)
Fall—evening; spring—evening. Continuation of Engineering Science 211. Mathematical topics include: introduction to tensor analysis, calculus of variations, finite differences, and integral equations.

216 *Advanced Dynamics* (3)
Time to be arranged. Dynamics of continuous mechanical systems; Lagrange's equations, Hamilton's principle, gyrodynamics; operational methods. Prerequisite: permission of the instructor.

217 *Analytical Mechanics* (3)
Fall—evening; spring—evening. Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations.

218 *Mechanics of Orbits and Trajectories* (3)
1962–63 and alternate years: fall—evening. Celestial mechanics. Orbits and trajectories in force fields. Dynamics of space vehicles.

219 *Mechanics of Continua* (3)
Time to be arranged. Mechanics of elastic, plastic, and vicous solids and of fluids; introduction to theory and formulation of basic equations.

220 *Nonlinear Mechanics* (3)
Spring—evening. Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations.

221 *Theory of Elasticity I* (3)
Spring—evening. Introduction to mathematical theory of elasticity, analysis of strain and stress, generalized Hooke's law, equilibrium equations, Beltrami-Michell equations, strain energy functions, torsion, general flexure.

222 *Theory of Elasticity II* (3)
1962–63 and alternate years: fall—evening. First and second boundary-value problems in plane elasticity, uniqueness of solutions, simply and multiply connected regions, three-dimensional problems, thermoelasticity, vibration of elastic solids, variational methods.

223 *Celestial Mechanics* (3)
Time to be arranged. General equations of motion; Lagrange's planetary equations; disturbing function; Delaunay and Poincaré variables; secular inequalities; lunar theory; precession and nutation.

227 *Experimental Stress Analysis* (3)
Time to be arranged. Applications of the theory of elasticity in the analysis of strain and stress; theory of gaging for static and dynamic strain and stress measurements.

230 *Dynamics of Compressible Fluids* (3)
Time to be arranged. Mathematical theory of compressible fluid flow and thermodynamics of compressible fluids. Prerequisite: permission of the instructor.

231 *Fluid Dynamics* (3)
Fall—evening. Theory of compressible and incompressible fluid motion including potential motion, circulation and vorticity, mathematical treatment of flow at sub-, trans-, and supersonic velocities, normal and oblique shock, and elements of heat transfer.

233 *Engineering Problems* (3)
Spring—evening. Investigation of problems in engineering science, emphasizing imaginative and systematic application of fundamental principles in engineering, physics, and mathematics.

241 *Science of Engineering Materials* (3)
1963–64 and alternate years: fall—evening. Relation of the atomic and microscopic structure of engineering materials to their physical and mechanical properties and their mechanical behavior in engineering applications.

251 *Magnetohydrodynamics* (3)
Time to be arranged. Study of the interaction of electromagnetic and fluid fields. Dynamics of conducting fluids in electromagnetic and magnetic fields.

299 300 *Thesis* (3–3)
Academic year—as arranged.

Civil Engineering

216 *Metal Structures* (3)
Time to be arranged. Structural behavior and failure of metal structures; materials; residual stresses; analysis and design of connections and members; theory of plastic collapse of structures; plastic design.

217 *Ultimate Strength of Reinforced Concrete Structures* (3)
Time to be arranged. Modes of failure of reinforced concrete structures; experimental data on failure; ultimate strength concepts for the analysis of beams, slabs, and columns.

218 *Prestressed Concrete Structures* (3)
Time to be arranged. Structural behavior and failure of prestressed concrete structures; materials; theory, analysis, and design of prestressed concrete structures and members.

224 *Theory of Plates and Shells* (3)
1962–63 and alternate years: spring—evening. Classical and modern theories of plates and shells; plates and cylindrical shells under different loadings and boundary conditions; equations for plates including shear, rotationally symmetric shells under small deformations and their applications.

226 *Plasticity of Solids* (3)
1963–64 and alternate years: fall—evening. Plastic flow and fracture of solids; theory of elastic perfectly plastic solids, including basic concepts, limit analysis of beams, rigid frames, and plane stress problems, theory of fracture.

234 *Geotechnics in Soil Mechanics* (3)
1962–63 and alternate years: fall—evening. Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action.

235 *Theoretical Soil Mechanics* (3)
1962–63 and alternate years: spring—evening. Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics.

238 *Foundation Engineering* (3)
Time to be arranged. Principles of soil mechanics and structural mechanics in the analysis and design of spread footings, mat and pile foundations, retaining walls, sheet piling and water front structures.

251 *Theory of Structures I* (3)
Fall—evening. Classical and modern theories for plane statically indeterminate structures, matrix analysis of structures, special problems.

252 *Space Structures* (3)
Spring—evening. Theory of structures in three dimensions; trusses, rigid frames, and thin-shell structures; matrix analysis and applications of computers.

253 *Theory of Structures II* (3)
Time to be arranged. Statically indeterminate structural theory, including single and multi-span rigid frames and arches, deflection theory for arches and suspension bridges, thermal stress, and failure of structures.

254 *Theory of Structural Dynamics* (3)
1963–64 and alternate years: spring—evening. Analysis of elastic structures under various dynamic loadings, both steady-state and transient, including vibrations of rigid frames, plates, and thin shells.

256 *Theory of Elastic Stability* (3)
1962–63 and alternate years: fall—evening. Beam-column problems and methods of analysis (including numerical analysis); lateral buckling of beams; buckling of rigid frames, arches, plates, stiffened plates, and shells; inelastic buckling.

272 *Experimental Structural Analysis* (3)
Time to be arranged. Experimental analysis of truss, rigid frame, plate, and shell structures; large- and small-deflection models; similitude.

275 *Concepts of Structural Design* (3)
Time to be arranged. Mechanical behavior and failure of structures as determined by properties of materials, nature of structure, and type of loading; selection of type of structure; structural analysis, its applications and possible simplifications.

295–96 *Research* (arr.)
Academic year—as arranged. Research or directed study.

Electrical Engineering

201 *General Network Analysis* (3)
Spring—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, elements of network synthesis.

202 *Advanced Network Analysis* (3)
Fall—evening. Advanced theory of lumped and distributed linear networks, matrices, stability, activity.

203 *Network Synthesis* (3)
Spring—evening. Basic techniques in the synthesis of linear two- and three-terminal passive networks; positive real functions; Foster, Cauer, Brune, Bott-Duffin, Darlington procedures; elements of active network synthesis.

211 *Electromagnetic Waves* (3)
Fall—day and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices.

212 *Field Analysis and Potential Theory* (3)
Spring—evening. Fields of force, divergence, Newtonian potentials at points of free space, solutions of Laplace's equation, harmonic functions, logarithmic potential.

213 *Microwaves* (3)
Fall—evening. Transmission lines; waveguides; antennas; resonators; amplifiers and oscillators; klystrons, magnetrons, traveling wave tubes.

214 *Electrodynamics* (3)
Spring—evening. Presence of moving matter in electromagnetic fields, force and energy in moving systems, relativistic concepts, tensors.

215 *Antennas* (3)
Fall—evening. Maxwell's equations, radiation, impedance, directional characteristics, arrays, aperture antennas.

221 *Active Network Theory* (3)
Fall—day and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems.

222 *Physical Electronics* (3)
Spring—evening. Physical principles underlying operation of various electronic devices including vacuum tubes, electron lenses, transistors, and recent solid-state electronic devices.

223 *High-frequency Electronics* (3)
Fall—evening. High frequency operation of electron tubes and semiconductor devices, transit time, bunching, pulse techniques.

224 *Industrial Electronics* (3)
Spring—evening. Gaseous tubes and applications; rectifiers; timing circuits; induction and dielectric heating; regulation and control, magnetic amplifiers.

225 *Electronic Measurements in Psychometrics and Medicine* (3)
Fall—evening. Theory of measurements in biological areas, field and circuit theory as a foundation for measurements, techniques for electronic measurements on biological specimens, problems in medicine and psychology with emphasis on measurements and measuring devices.

226 *Physical Basis for Medical Electronics* (3)
Spring—evening. Electrical and acoustical properties of biological material; structural components of biological material as they affect its dielectric and acoustical behavior, electrical relaxation phenomena in general and their application to biological material in particular, applications in diathermy and electrocardiography, impedance determination.

231 *Digital Circuitry and Systems* (3)
Fall—day. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits.

232 *Digital Techniques* (3)
Spring—day. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams.

233 *Digital Systems* (3)
Fall—evening. The programmed system; system design of digital computers, special-purpose digital computers, reliability, data-processing techniques, analog-to-digital and digital-to-analog techniques.

234 *Automata and Self-organising Systems* (3)
Spring—evening. Effectively computable functions and Turing machines, digital computational methods in Boolean algebra, combinational circuits and their analysis, recursion circuits and their analysis, reliability of automata, networks of automata, artificial intelligence.

241 *Analysis of Modulation and Noise* (3)
Fall—evening. Analysis by Fourier series and integrals of signals and linear networks, modulation and spectra, noise analysis including probability method of determining power spectra.

242 *Information Theory* (3)
Spring—evening. Discrete and continuous systems; ergodic ensembles and random processes; correlations, filtering, prediction; redundancy.

243 *Electromagnetic Wave Propagation* (3)
Fall—evening. Ground waves; space-wave propagation, atmospheric effects, ionosphere; maximum usable frequency; bandwidth.

244 *Communication Systems* (3)
Spring—evening. Radar; television; ultra-high frequency; navigational aids.

251 *Power Transmission* (3)
Fall—evening. Transmission lines, exact and approximate equivalent circuits, standing waves, filtering, protection, radio interference, high voltage, line configurations.

252 *Power Generation* (3)
Spring—evening. Steam, hydroelectric and nuclear plants, fuel cells and magnetohydrodynamics, efficiency, reheat cycles, stability, load factors, generator swings.

253 *Power Systems* (3)
Fall—evening. Substations, transformers, distribution, networks; short and open circuit analysis; symmetrical components; stability; network analysers.

Mechanical Engineering

211 *Thermodynamics* (3)
Fall—evening. Reversible and irreversible processes, equilibrium, ideal and van der Waal's gases, dilute solutions, phase equilibria, electric and magnetic effects, radiation. Introduction to kinetic theory and statistical mechanics.

213 *Heat Transfer* (3)
Spring—evening. Physical and mathematical concepts of heat transfer phenomena under steady and unsteady conditions, including: Stefan-Boltzmann and Planck laws for radiation, Fourier heat equation for conduction, dimensional analysis, and boundary layer theory for convection.

215 *Gas Dynamics* (3)
Spring—evening. Theory of gas dynamics including: combustion, shock phenomena, dynamics of flow, and heat transfer for high temperature gases.

235 *Hypersonic Fluid Dynamics* (3)
Time to be arranged. Small disturbance theory; Newtonian theory; constant-density solutions; thin shock layers; viscous interactions; free molecule and rarefied gas flows.

255 *Combustion Processes* (3)
Time to be arranged. Thermodynamics of combustion; chemical kinetics; flame propagation; combustion of liquids and solids; detonation processes.

256 *Reaction Kinetics* (3)
Time to be arranged. Theoretical aspects of kinetics of homogeneous and heterogeneous reactions in gaseous and liquid systems.

Metrology

201 *Advanced General Metrology* (3)

203–4 *Probability and Statistics of Metrology I–II* (3–3)
Probability distributions, discrete and continuous distributions; sampling; combinational analysis; stochastic processes; conditional probability; correlation; analysis of

† Credit is not given for English A, B; Mathematics 3, 6; or Speech B.

variance; design and analysis of experiments, Latin Square experiments, factorial experiments, block and lattice designs. Prerequisite: Metrology 4 or the equivalent and graduate status.

214 *Microwave Measurements* (3)
Measurement of power, frequency, impedance, wavelength, and attenuation at microwave frequencies. Characteristics and Q of resonant devices. Prerequisite: Electrical Engineering 104 or the equivalent and graduate status.

220 *Precise Optical Measurements* (3)
Optical constants of lens systems; aberration; resolving power; illumination in focal plane; image evaluations, magnification, index of refraction; color and color temperature.

REQUIRED AND ELECTIVE COURSES FROM OTHER DEPARTMENTS

On the following pages appears a list of courses, offered in other departments of instruction, which are required in one or more of the engineering curricula.

Courses in the options of the Bachelor of Science in Engineering curriculum are to be selected from the offerings of the department of option with the approval of the chairman of the department. A complete listing of courses in these departments appears in the general catalogue of the University.

Required elective courses in the humanities and social studies may be selected from the offerings of the following departments of instruction:

Art
Classical Languages and Literatures
Economics
English:
  American Literature
  English Literature
Geography
Germanic Languages and Literatures
History
Philosophy
Political Science
Religion
Romance Languages and Literatures
Slavic Languages and Literatures
Sociology and Anthropology

Courses offered in these departments are described in the general catalogue of the University.

Electives (other than required electives in the humanities and social studies) taken to fulfill the 140 semester hour degree requirement need not to be confined to the above list, but credit is not given for courses in Physical Education or Secretarial Studies. Credit is not given for English A, B; Mathematics 3, 6; or Speech B.

ACCOUNTING

115 *Survey of Accounting* (3)
Accounting systems used by single proprietorships and corporations with emphasis on methods of compiling, analyzing, classifying, and summarizing accounting data; and the use of accounting information in the management process. Not open for credit to Accounting or Business Administration majors.

215 *Survey of Managerial Accounting* (3)
Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process.

293 *Budget Preparation and Administration* (3)
Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial, industrial, and government organizations.

AIR SCIENCE

Basic Course

1–2 *Leadership Laboratory—Freshman Year* (1–1)
Cadet basic airman training. Military courtesy, discipline, appearance, and bearing; element, flight squadron, and mass formation drill; parades and ceremonies. Minimum 15 hours a semester. Laboratory fee, charged one time a year, $3.

11–12 *Leadership Laboratory—Sophomore Year* (1–1)
Cadet noncommissioned officer training. Military bearing and courtesy, all phases of drills and ceremonies, command voice training and command responsibility. Prerequisite: Air Science 1–2 and 22 for men; Air Science 1–2 for women. Minimum 15 hours a semester. Laboratory fee, charged one time a year, $3.

22 *Air Science—Freshman Year* (2)
Foundations of Air Power. General survey of air power to include control, navigation, and propulsions systems; space vehicles; military instruments of national security; and professional opportunities in the United States Air Force.

51 *Air Science—Sophomore Year* (2)
Foundations of Air Power. General survey of the roots and development of aerial warfare emphasizing the principles of war, concepts of employment of forces, and the impact of changing weapon systems. Treatment of aerial warfare is undertaken to include targets and weapons.

Advanced Course

101–2 *Air Science—Junior Year* (1–1)
Air Force Officer Development. Knowledge and skills required of a junior officer in the Air Force. First half includes staff organization and functions. Second half includes the military justice system. Prerequisite or concurrent registration: Business Administration 102 and 193 which are not to be taken in the same semester of the academic year.

103–4 *Leadership Laboratory—Junior Year*
(Credit is a part of Air Science 101–2)
Cadet noncommissioned officer and officer training. Wearing of the uniform, parades and ceremonies, commands and command voice. Cadets perform duties involving planning for and supervision of Cadet Corps activities. Emphasis placed on leadership and management proficiency. Minimum 15 hours a semester.

105 *Summer Training Unit—Between Junior and Senior Years* (required)
Attendance at a four-week Air Force ROTC summer training unit at an Air Force base within continental United States is mandatory. Program consists of familiarization flying, physical training, individual weapons, Air Force base activity and equipment, field exercises, air base problems, and leadership training.

151–52 *Air Science—Senior Year* (1–1)
First half: weather and navigation. A study of the weather and navigational aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, and dead reckoning navigation. *Second half:* the Air Force officer. A study of materials to help the cadet make a rapid, effective adjustment to active duty as an officer of the United States Air Force. Prerequisite or concurrent registration: Political Science 171 and Geography 146, which are not to be taken in the same semester of the academic year.

153–54 *Leadership Laboratory—Senior Year*
(Credit is a part of Air Science 151–52)
Cadet officer training. Cadet officers conduct activities of Corps of Cadets through chain of command, instruct subordinates, plan and supervise Cadet Corps training and administration. Preparation for commissioned officer duties. Development of leadership and managerial responsibilities. Minimum 15 hours a semester.

BUSINESS AND PUBLIC ADMINISTRATION

Business Administration

250 *Contract Administration* (3)
Primarily for students in the Engineering Administration program. The administration, negotiation, and renegotiation of contracts between the government and industry for engineering, scientific, and other professional services, facilities, and materials. Contract policies; fixed-price and cost-plus-fixed-fee, bidding, etc.

Public Administration

213 *Administration in Government* (3)
Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

CHEMISTRY

11–12 *General Chemistry* (4–4)
A year course: credit is not given for the first half until the second half is completed. Lecture, laboratory, and recitation. Prerequisite: one year of high school algebra. Laboratory fee, $18 a semester.

13–14 *General Chemistry* (4–4)
A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). General chemistry for engineering students. Prerequisite: Mathematics 12 or 21, Physics 11. Laboratory fee, $18 a semester.

ENGLISH*

A *English for Foreign Students*†
A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B *English for Foreign Students*† (3)
For second-semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

1 *English Composition** (3)
Review of grammar, exercise in composition, readings.

1X *English Composition** (3)
An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is $115 (the regular fee of $30 a semester hour, plus an additional fee of $25).

2 *English Composition** (3)
The second half of the six-hour English Composition course required of all students. Readings and practice in expository and argumentative techniques and in research procedure.

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* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared for English 1 will be assigned to English 1X. English 1 or 1X is prerequisite to all other courses in English.

† Credit is not given for English A, B; Mathematics 3, 6; or Speech B.

MATHEMATICS

3 *College Algebra*† (3)
Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 *Plane Trigonometry*† (3)
Prerequisite: two years of high school algebra and one year of high school geometry or Mathematics 3 (or concurrent registration therefor).

12 *Analytic Geometry* (3)
(This course will be offered for the last time summer 1962.)
Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

21 *Calculus I* (3)
Elementary concepts of analytic geometry. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite: Mathematics 3 and 6; or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or the equivalent.

22 *Calculus II* (3)
Differentiation and integration of transcendental functions and applications; conics; parametric equations; techniques of integration. Prerequisite: Mathematics 21.

23 *Calculus III* (3)
Vector concepts; improper integrals; solid geometry; partial differentiation and applications. Prerequisite: Mathematics 22.

24 *Calculus IV* (3)
Multiple integration with applications; infinite series; differential equations. Prerequisite: Mathematics 23.

27 *Calculus I and II* (6)
The equivalent of Mathematics 21 and 22.

28 *Calculus III and IV* (6)
The equivalent of Mathematics 23 and 24.

29 *Calculus I* (3)
(This course will be offered for the last time summer 1962.)
Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

30 *Calculus II* (3)
(This course will be offered for the last time fall semester 1962–63.)
Differentiation and integration of transcendental functions with applications, methods of integration, vectors, and parametric equations. Prerequisite: Mathematics 12, 29.

31 *Calculus III* (3)
(This course will be offered for the last time spring semester 1962–63.)
Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor).

111 *Mathematics for Engineers and Physicists I* (3)
Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31, or 24.

112 *Mathematics for Engineers and Physicists II* (3)
Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.

† Credit is not given for English A, B; Mathematics 3, 6; or Speech B.

PHYSICS

11 *Introductory Physics* (3)
An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by non-science students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Lecture, laboratory, and recitation. Material fee, $11.

14 *General Physics* (3)
Mechanics, wave motion, and sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29 or 22. Lecture, laboratory, and recitation. Material fee, $11.

15 *General Physics* (3)
Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration: Mathematics 30 or 23. Lecture, laboratory, and recitation. Material fee, $11.

16 *General Physics* (3)
Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30 or 23, and consent of the instructor.

116 *Quantum and Solid State Physics* (3)
Primarily for engineers. Prerequisite: Physics 16, Mathematics 111.

191 *Nuclear Reactors* (3)
Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16, Mathematics 31 or 24.

PSYCHOLOGY

145 *Principles of Human Relations* (3)
Primarily for students in the Engineering Administration program. Survey of the psychological principles involved in dealing with individuals and groups.

STATISTICS

91 *Principles of Statistical Methods* (3)
Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, $9.

107 *Statistics for Engineers* (3)
Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

262 *Managerial Statistics and Quality Control* (3)
Primarily for students in the Engineering Administration program. The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

271–72 *Statistical Information Theory* (3–3)
A year course: credit is not given for the first half until the second half is completed. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shannon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing; asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison of experiments.

ALUMNI AND ALLIED ASSOCIATIONS

THE GENERAL ALUMNI ASSOCIATION

The obectives of this Association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or the Board of Trustees of the University. Active members are those eligible members who are current contributors to or life members of The George Washington University General Alumni Association, the Alumni Associations of any school of the University, or contributors to the Alumni Fund.

The Alumni Office is in Bacon Hall, 2000 H Street NW., Washington 6, D. C.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

THE ENGINEER ALUMNI ASSOCIATION OF THE GEORGE WASHINGTON UNIVERSITY

The Engineer Alumni Association was organized in 1936 and has been affiliated with the General Alumni Association since that time. Its objects are to unite the graduates and Faculty of the School of Engineering in closer fellowship, to promote the general welfare of the School of Engineering and of the University at large, to foster activities of the engineering organizations recognized by the University, and to advance the profession of engineering in general.

INDEX

A

Absence, regulations concerning
  See Attendance
Academic status of the University, 3
Accounting, courses in, 57
Administration, Officers of, 2
Administrative Assistants, 5
Admission, 16–19, 35, 39
Advanced Placement Examinations, 18–19
Advanced standing, 18–19, 35
Advisory system, 25
Air Force Reserve Officers Training Corps, 8–9, 21, 22, 58
Air Science, courses in, 58
Alumni and Allied Associations, 62
Amount of Work, 25
Assistants in Instruction, 5
Attendance, 24–25, 29

B

Business and Public Administration, courses in, 59

C

Calendar for 1962–63, iii
Center for Measurement Science, 41–43
Changes in program of studies, 21, 22, 27–28
Chapel, 11
Chemistry:
  Bachelor of Science in Engineering option in, 35
  Courses in, 59
Civil Engineering:
  Graduate courses in, 53–54
  Undergraduate courses in, 44–46
  Undergraduate curriculum in, 32–33
Colleges, Schools, and Divisions of the University, 3
  See Also Inside back cover
Committees of the Faculty, 5–6
Conduct, 29
Contents, table of, ii
Counseling center, 12
Courses of Instruction, 44–61
Credit:
  Credit hours, explanation of, 44
  Credit hours, maximum allowed full- and part-time students, 25
  For summer school work, 28
  Toward a degree, 28
  Transfer from other institutions, 17, 19, 35

D

Davis-Hodgkins House, 11
Degrees:
  Bachelor of Civil Engineering, 7, 18, 31–33
  Bachelor of Electrical Engineering, 7, 18, 31, 33
  Bachelor of Mechanical Engineering, 7, 18, 31, 34
  Bachelor of Science in Engineering, 7, 18, 31, 34–35
  Doctor of Science, 7, 38–40
  Engineering Technologist Certificate, 7, 18, 31, 41, 42
  Master of Engineering Administration, 7, 35–36, 37–38
  Master of Science in Engineering, 7, 35–37
Dishonesty, regulations concerning, 27
Dismissal of students, 31
Dissertations, 29–30, 40
Dropping courses, 21, 27–28

E

Electrical Engineering:
  Graduate courses in, 54–56
  Undergraduate courses in, 46–48
  Undergraduate curriculum in, 32, 33
Emeritus Faculty, 4
Employment, student, 12
Engineering Administration:
  Bachelor of Science in Engineering option in, 35
  Courses in, 50–51
Engineering Science, Graduate courses in, 51–53
Engineers' Council, 14
English:
  Courses in, 59
  Use of correct, 28
Entrance requirements, 17–18, 35, 39
Examinations:
  Advanced Placement, 18–19
  College Entrance Board, 18
  Comprehensive examination for Master's degrees, 36, 37
  For admission, 18
  For qualifying for advanced standing or waiving curriculum requirements, 18–19
    See also in Calendar
  Graduate Record, 17, 20, 29
  Physical, 10
Faculty:
  Alphabetical list, 4–5
  Standing committees, 5–6
Fees, 20–23
Financial aid, 24
Financial regulations, 21–23
Foreign students, 12
Fraternities, 16

G

Government of the University, 3
Grades, 25–26
Grading system, 25–26
Graduate Record Examination, 29
Graduate study, 35–40
  Admission to, 35
Graduation:
  Application for, 29
  Dates
    See Calendar
  Requirements, 29–30

H

Health Administration, 9–10
History of the University, 3
Honor Societies, 15
Honors, 30
Honors List, 28
Hours of Instruction, 7

I

International House, 12

L

Laboratory fees and deposits, 21
  See also Courses of Instruction
Library, 19, 31
Living accommodations, 10–11
Loan funds, 24
Location of the University, 3
"Lost and Found" Office, 31

M

Machine Computer, Bachelor of Science in Engineering option in, 35
Mathematics:
  Bachelor of Science in Engineering option in, 35
  Courses in, 60
Measurement Science:
  Center for, 41–43
  Courses in, 51–53
Mechanical Engineering:
  Graduate courses in, 56
  Undergraduate courses in, 48–49
  Undergraduate curriculum in, 32, 34
Medical privileges, 9–10, 19

O

Objective of the School of Engineering, 6
Orientation Program, 7

P

Physics:
  Bachelor of Science in Engineering option in, 35
  Courses in, 61
Placement Office, 12
Prizes, 23–24
Probation, 26
Professional organizations, 16
Programs of study, 7
Property, responsibility for, 31
Psychology, courses in, 61
Public Administration, courses in, 59
Publications, student, 16, 19

Q

Quality-point index, 26

R

Reading Clinic, 12–13
Readmission, 16–19
Records, transcripts of, 17, 21, 28
Refunds, 21–23
Registration, 19–20
Regulations, 24–31
Religious Life, 11
Religious organizations, 16
Residence Halls, 10–11
Residence requirements, 29
ROTC:
  See Air Force Reserve Officers Training Corps
Rules of the University, right to change, 31

S

Scholarship requirements, 25–27, 36
Scholarships, 23
Service School credits, 8
Sororities, 16
Staff of Instruction, alphabetical list, 4–5
Statistics, courses in, 61
Student:
  Activities, 13–15
  Organizations, 15–16
  Placement Office, 12
  Publications, 16, 19
  Union, 11
Suspension, 26–27

T

Testing and Counseling Center, 12
Thesis, 29–30, 36, 37
Transcripts of records, 17, 21, 28
Trustees, Board of, 1
Tuition, 20

V

Veterans Education, 7–8
Vocational counseling, 12

W

Warning, mid-semester, 26
Withdrawal, 21–23, 27



The Photoelastic Polariscope—for Engineering Research



Class Break, Tompkins Hall of Engineering



Electronics—an Essential in Modern Engineering

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Columbian College of Arts and Sciences: Associate in Arts (A.A.), Associate in Science (A.S.), Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)

Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

National Law Center

Law School: Bachelor of Laws (LL.B.)

Graduate School of Public Law: Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L. (Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

School of Engineering: Engineering Technologist Certificate (Eng. Tech. Cert.), Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.) and Master of Science in Pharmacy (M.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Physical Education (B.S in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)

School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: Associate in Arts (A.A.(C.G.S.)), Associate in Science (A.S.(C.G.S.)), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.(C.G.S.)), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.(C.G.S.)), Master of Arts in International Affairs (A.M. in I. A.), and Master of Business Administration (M.B.A.(C.G.S.)).

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications should be addressed as indicated.

College of General Studies.....Dean of the College of General Studies
Columbian College of Arts and Sciences.....Director of Admissions
Fellowships, Scholarships, Prizes,
Financial Aid.....Chairman, Committee on Scholarships
General Catalogue of the University.....Director of Admissions
Graduate Council.....Dean of the Graduate Council
Law School.....Director of Admissions
School of Education.....Director of Admissions
School of Engineering.....Dean of the School of Engineering
School of Medicine.....Director of Admissions
Summer Sessions.....Dean of the Summer Sessions
Schedule of Classes: Fall and Spring Semesters.....Registrar
Schedule of Classes: Summer Sessions.....Dean of the Summer Sessions

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1960

THE LAW SCHOOL, 1865

THE GRADUATE SCHOOL OF PUBLIC LAW, 1960

THE SCHOOL OF ENGINEERING, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF SPECIAL STUDENTS, 1944

THE DIVISION OF AIR SCIENCE, 1951

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

The George Washington University

Bulletin



THE SCHOOL OF MEDICINE

1962-63

WASHINGTON 6, D. C.
OCTOBER 1961
Vol. LXI No. 1

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

Admission.....Director of Admissions, Building C

Air Science (ROTC).....Director of Air Science, Chapin Hall

Alumni Association.....Alumni Office, Bacon Hall

Foreign Students.....Adviser to Foreign Students, Building T

Graduate Study

In Arts and Sciences

Master's degrees.....Dean of Columbian College of Arts and Sciences

Doctor of Philosophy.....Dean of The Graduate Council

In Education.....Dean of The School of Education

In Engineering.....Committee on Graduate Studies, School of Engineering

In Law.....Dean of The Law School

In Accounting, Business Administration, Business and Economic Statistics, Economic Policy, Hospital Administration, International Affairs, Personnel Administration, Public Administration, Public Affairs.....Dean of The School of Government, Business, and International Affairs

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Student Employment.....Student Placement Office, 2114 G Street NW.

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School of Medicine—Research and Administration Buildings



The George Washington University Hospital and Clinics

THE SCHOOL OF MEDICINE

1962-1963

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Bulletin

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1962-63

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CONTENTS

	Page
Calendar of the School of Medicine	vi
The Board of Trustees	1
Officers of Administration	2
The University: History and Organization, Academic Status, Location	3
The School of Medicine	4
Faculty and Staff of Instruction	4
The University Hospital	34
Courses of Instruction	39
Anatomy	39
Anesthesiology	40
Biochemistry	41
Dermatology and Syphilology	42
Medicine	42
Microbiology	44
Neurology and Neurological Surgery	46
Obstetrics and Gynecology	47
Ophthalmology	48
Otolaryngology	48
Pathology	48
Pediatrics	50
Pharmacology	51
Physical Medicine and Rehabilitation	52
Physiology	53
Psychiatry	54
Radiology	55
Surgery	55
Urology	55
The School of Medicine Record:	
Degrees Conferred, June 6, 1961	60
Students Registered, 1961–62	62
Summaries of Registration, 1961–62	67
Index	69

CALENDAR OF THE SCHOOL OF MEDICINE

1962–63

Fall Semester:	1962	
Registration	Sept. 13	Thurs.
Classes begin	Sept. 17	Mon.
Veterans Day. Holiday	Nov. 12	Mon.
Thanksgiving recess	Nov. 22–24	Thurs.–Sat.
Christmas recess	Dec. 22–Jan. 2	Sat.–Wed.
	1963	
Classes resume	Jan. 3	Thurs.
Tuition for spring semester due	Jan. 11	Fri.
Examination period	Jan. 21–26	Mon.–Sat.
Spring Semester:		
Classes resume for spring semester	Jan. 28	Mon.
Winter Convocation. Holiday	Feb. 22	Fri.
Easter recess	April 12 and 13	Fri. and Sat.
Examination period	May 20–28	Mon.–Tues.
Memorial Day. Holiday	May 30	Thurs.
Baccalaureate Service	June 2	Sun.
Commencement	June 5	Wed.
Registration for the academic year 1963–64	Sept. 12	Thurs.

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* For the academic year 1961–62.

THE UNIVERSITY

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The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of Columbian College of Arts and Sciences, which offers work leading to Associate's, Bachelor's, and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine; Law; Engineering; Pharmacy; Education; and Government, Business, and International Affairs; the College of General Studies; the Division of University students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The George Washington University is a privately endowed University located on a well planned campus in the center of Washington within a few blocks of the White House. The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an ex officio member of the Board.

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The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Medicine has had continuous approval by the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges. The degree of the School of Medicine is recognized by all State Examining Boards.

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The University is in downtown Washington within a few blocks of the White House and the Federal Triangle of Government buildings, which house many of the departments of the Federal Government, and such museums of special interest to medical students as the Smithsonian Institution, the National Museum, and the Botanic Gardens.

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JOHN RUSSELL WEIMER, B.S., M.D., *Clinical Instructor in Ophthalmology*
JACOB JOSEPH WEINSTEIN, B.S., Phar.G., M.D., *Associate in Surgery*
DANIEL LEIGH WEISS, A.B., M.D., *Clinical Professor of Pathology*
ARTHUR WEISSBACH, Ph.D., *Professorial Lecturer on Enzymes*
DON WENGER, M.S., M.D., *Associate Clinical Professor of Surgery*
FRANCIS LIELL WENGER, M.D., *Associate in Physical Medicine and Rehabilitation*
SIDNEY LEE WERKMAN, A.B., M.D., *Clinical Instructor in Psychiatry*
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MARGARET ELISABETH WESTECKER, Dr. rer. nat., *Associate in Physiology*
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ALLEN WIDOME, M.D., *Clinical Instructor in Anesthesiology*
UTHAI VINCENT WILCOX II, M.D., *Clinical Instructor in Radiology*
RICHARD WALLACE WILKINSON, A.B., M.D., M.S. in Med., *Assistant Clinical Professor of Ophthalmology*
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Samuel Yochelson, Ph.D., M.D., *Research Professor of Psychiatry*
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ASSISTANTS

ASSISTANTS IN RESEARCH AND INSTRUCTION

Kristoff Abraham, M.D., *Fellow in Neuropathology*
Concordia Borja, M.S., *University Teaching Fellow in Biochemistry*
Pierre Jean Carpentier, M.D., *Fellow in Medicine (Gastroenterology)*
Mary Ann Flesner, B.S., *Sanders Fellow in Microbiology*
John LeRoy Fox, M.D., *Fellow in Neuropathology*
Ralph Richard Gray, M.S., *Fellow in Biochemistry*
Julian Hoptman, A.M., *Research Fellow in Microbiology*
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Richard Kaufman, A.B., M.D., *Fellow in Medicine*
Marie-Louise Levy, B.S., M.D., *Fellow in Anesthesiology*
Robert Marx Mayer, A.B., *Sanders Fellow in Biochemistry*
Yutaka Ohsaki, M.D., *Fellow in Medicine (Pulmonary Disease)*
Vincent Pateras, A.B., M.D., C.M., *Fellow in Medicine*
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Alan Lee Pinkerson, A.B., M.D., *Fellow in Medicine (Cardiovascular Disease)*
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Asakatsu Suzuki, M.D., *Fellow in Anesthesiology*
Andree Raymonde Jeanne-Marie Thomas, P.C.B., M.D., *Fellow in Medicine (Cardiovascular Disease)*
Robert Tomchick, B.S., *Teaching Fellow in Pharmacology*
Edward Winn Walters, B.S. in Ed., M.S., M.D., *Fellow in Medicine (Infectious Disease and Immunology)*
Leslie Wiener, B.S., M.D., *Fellow in Medicine (Cardiology)*
Ramiro Jose Abaunza, B.S., M.D., *Assistant in Obstetrics and Gynecology*
Arsacio Abella, D.M.D., *Assistant in Anesthesiology*
Palma Abraham, M.D., *Assistant in Radiology*
Manuel Angoso-Dufourcq, M.D., *Assistant in Medicine*
Ronald Alan Apter, M.D., *Assistant in Medicine*
William Landon Banfield, A.B., M.D., *Assistant in Surgery*
Samuel Michael Belinsky, A.B., M.D., *Assistant in Obstetrics and Gynecology*
Frank Joseph Borsody, A.B., M.D., *Assistant in Medicine*
Ronald Jack Bortnick, A.B., M.D., *Assistant in Neurological Surgery*
Gloria Godbey Brennan, A.B., M.D., *Assistant in Pathology*
Armon Anthony Cairo, B.S., M.D., *Assistant in Psychiatry*
Don Bruce Cameron, B.S., M.D., *Assistant in Medicine*
David Roland Carlson, B.S., M.D., *Assistant in Obstetrics and Gynecology*
Plja Charif, M.D., *Assistant in Pediatrics*
Attila Sakir Cigtay, A.B., M.D., *Assistant in Radiology*
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Robert Watkins Clarke, Jr., *Chief Photographer, Medical School Photographic Laboratory*
Barbara Zelda Farfel, *Technician in Medicine*
Yosif Kadir, B.S., *Technician in Biochemistry*
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Part-time Technical Assistant

Elizabeth Crisp Rea, A.B., M.T., *Technician in Medicine*

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NANCY PAT ALEXANDER, *Assistant in Medical Library*
MARIE NORTON LYNCH, *Clerical Assistant*

THE SCHOOL OF MEDICINE *

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Professors H. F. Anderson, R. H. Barter, Brian Blades, T. M. Brown, Paul Calabrisi, C. S. Coakley, R. A. Cox, A. M. Griffin, C. E. Leese, H. G. Mandel, John Parks, T. M. Peery, E. M. Renkin, W. W. Stanbro, Harold Stevens, I. R. Telford, C. R. Treadwell, J. W. Watts, C. S. Wise, Leon Yochelson
Clinical Professors W. S. Anderson, L. R. Culbertson, C. B. Ethridge, W. A. Howard, W. S. McCune, E. A. W. Sheppard
Associate Professors F. N. Miller, Jr., A. E. Parrish
Associate Clinical Professor J. J. McFarland, Jr.
Assistant Clinical Professor J. L. Levine
Administrator of the University Hospital V. F. Ludewig

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T. M. Peery, *Chairman*
E. M. Renkin, M. J. Romansky, J. G. Sites, I. R. Telford, J. R. Thistlethwaite, C. R. Treadwell

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* Faculty and committee members listed here are for the academic year 1961–62.
† The President of the University, the Dean of Faculties of the University, and the Registrar of the University are members of the Faculty.
‡ The Dean of the School of Medicine and Associate Deans are members ex officio of all committees.

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F. N. Miller, *Chairman*

Seymour Alpert, J. B. Christensen, Ruth McClintock, H. C. Pierpont

GENERAL INFORMATION

INTRODUCTION

The School of Medicine of The George Washington University was opened in March 1825. Of the medical schools now in existence in the United States, it is the eleventh in chronological order of founding. The University Hospital and Dispensary were established in 1898 as a part of the organization of the School. The present George Washington University Hospital was opened in 1948, and the Helen L. and Mary E. Warwick Memorial Building housing the Cancer Clinic was completed in 1954. Additional clinical facilities are used at the District of Columbia General Hospital, Children's Hospital, St. Elizabeths Hospital, and Mt. Alto Veterans Administration Hospital. The School of Medicine maintains close affiliation not only with the various divisions of the University, but also with the numerous medical research and scientific establishments of the federal government in the Nation's Capital. Washington provides world renowned library facilities, comprehensive museums, and excellent recreational facilities which are available to students.

OBJECTIVES

The purpose of the School of Medicine is to prepare men and women in the art and science of medicine to meet the health needs of a growing, ever changing society. It is the responsibility of the School of Medicine to provide its students with a systematic plan of instruction in the basic medical sciences, with well guided clinical experience, with opportunities for expression in research, and with a philosophy in keeping with the highest ethics of the profession.

To achieve these objectives the School of Medicine has developed a progressive plan of instruction and a balanced, comprehensive curriculum. To carry out the program the University maintains a faculty of adequate size and of outstanding ability and makes use of facilities which provide exceptional opportunities for research and clinical training.

PLAN OF INSTRUCTION

The curriculum is a progressive one, beginning with basic medical science and expanding to include the more complex aspects of the prevention of disease and care of the sick. The teaching program is organized under the various departments of the School of Medicine. (See "Courses of Instruction", pages 39–57.)

The schedule for the first year begins with an orientation week designed to introduce the new students to the Faculty, to the upperclassmen, and to the environment for their medical education. The students meet for informal panel discussions with upperclassmen and members of the Faculty on such subjects as curriculum, medical terminology, use of library facilities, ethics and aims of the medical profession, and student health.

First year instruction is given in anatomy, biochemistry, and physiology using the classroom and laboratory facilities of the School of Medicine. Early in their medical careers students are encouraged to participate in research.

Having completed the preliminary study of structure and function of the normal body, the student progresses in the second year to a consideration of disease processes and mechanisms. The various microbial agents capable of causing disease are studied in the course in microbiology, and the effect of these and other harmful substances upon the body are studied in the course in pathology. The modes of action of various therapeutic agents are considered in the course in pharmacology. Introductory lectures and demonstrations in the clinical sciences are given during the second semester in order to prepare the student for the responsibilities of the following year.

In the third year the student is assigned to the University Hospital and affiliated hospitals for lectures, conferences, and clinical studies. He serves in the various divisions of the hospital assisting in the preparation of clinical records and performing certain clinical laboratory examinations. He learns to apply diagnostic and therapeutic procedures in the care of patients. During this period instruction is individual or in small groups. The instructor reviews the student's observations at the bedside and guides him in the development and application of his knowledge.

During the following summer each fourth year student is required to spend eight weeks in one of the clinical facilities of the School of Medicine. In the fourth year the student's responsibility for inpatient care continues and enlarges, but at least an equal part of his time is spent in the study and care of clinic patients. The University Hospital, the District of Columbia General Hospital, Children's Hospital, Mount Alto Veterans Administration Hospital, and St. Elizabeths Hospital provide the students with experience in many fields. In this final

year of formal medical education stress is placed upon the total patient and his environment so that emotional and economic as well as physical factors may be considered in the restoration of the individual to a state of health and happiness.

Upon satisfactory completion of the four-year course of the School of Medicine, the student is well prepared for graduate training leading to a career in general or specialty practice, research, medical education, or government service.

THE CURRICULUM

First Year

Subject	Lecture	Laboratory or Clerkship	Conference	Total
Anatomy				656
Biochemistry	64	192	32	288
Physiology	64	192	32	288
Disaster Medicine	16	—	—	16
Psychiatry	32	—	—	32
Total				1,280

Second Year

Subject	Lecture	Laboratory or Clerkship	Conference	Total
Microbiology	64	144	16	224
Pathology	64	136	32	232
Pharmacology	40	80	24	144
Physical Diagnosis	16	96	—	112
Psychiatry	32	48	—	80
Clinical Microscopy	16	32	—	48
Medicine	48	—	—	48
Surgery	32	—	—	32
Community Health	32	—	—	32
Pediatrics	32	—	—	32
Neurology	32	—	—	32
Obstetrics and Gynecology	16	—	—	16
Radiology	16	—	—	16
Forensic Pathology and Medical Jurisprudence	16	—	—	16
Dermatology	16	—	—	16
Total	472	536	72	1,080

Third Year

Subject	Lecture, Conference or Clinic	Laboratory or Clerkship	Total
Anesthesiology	16	—	16
Clinical Pathological Conference	16	—	16
Medicine	64	240	304
Medical Laboratory	—	60	60
Neurology	16	60	76
Obstetrics and Gynecology	96	120	216
Ophthalmology	16	—	16
Pediatrics	32	120	152
Physical Medicine	16	—	16
Psychiatry	16	—	16
Radiology	16	—	16
Surgery	112	240	352
Otolaryngology	16	—	16
Admitting and Emergency	—	120	120
Therapeutic Conference	32	—	32
Urology	16	—	16
Total	480	960	1,440

Summer Clerkship

Medicine, Surgery, Obstetrics and Gynecology *or* Pediatrics—eight weeks between third and fourth years.

Fourth Year

Subject	Lecture, Conference or Clinic	Laboratory or Clerkship	Total
Cancer Clinics	—	120	120
Clinical Pathological Conference	28	—	28
Forensic Medicine	12	—	12
Medicine	—	360	360
Obstetrics and Gynecology	—	240	240
Pediatrics	28	240	268
Psychiatry	—	120	120
Public Health Practice	5	—	5
Surgery	—	360	360
Surgical Anatomy	15	—	15
Surgical Pathology	12	—	12
Total	100	1,440	1,540

EQUIPMENT AND FACILITIES

Medical School Building.—The building housing the School of Medicine is a five-story structure with lecture rooms, classrooms, students' rooms, and the following laboratories: anatomy; biochemistry; microbiology; pathology; pharmacology; and physiology.

They are fully equipped to enable students to pursue adequately the laboratory courses and to acquire the technical skill necessary in modern clinical and investigative work.

Research and Administration Building.—The Research Building houses special laboratories for graduate and staff research in the departments of Anatomy; Biochemistry; Microbiology; Pharmacology; and Physiology. Special facilities are provided for the study of radioactive compounds, for tissue-culture techniques, and virologic procedures. Selected students are invited to participate in certain aspects of the research program either on a volunteer basis or with the support of special Research Scholarships.

On the first floor, the west wing is occupied by a modern medical library; the east wing houses the administrative offices of the School of Medicine. Photographic laboratories and other facilities for audiovisual aids to education are on the second floor.

Medical Library.—The Medical Library in well-equipped quarters on the first floor of 1339 H Street NW., contains 24,500 carefully selected volumes, including the new medical works and the principal medical journals.

Interlibrary loan service is maintained with other medical and scientific libraries.

The Medical Library is open from 9:00 A.M. to 10:00 P.M. each class day, Monday through Friday, and from 9:00 A.M. to 5:00 P.M. Saturday.

A branch of the Medical Library is maintained in the University Hospital for the use of the resident physicians, interns, and students. It is open Monday through Friday, 1:00 to 5:00 P.M. and 6:00 to 11:00 P.M. During the academic year the library is also open Saturday and Sunday from 1:00 to 5:00 P.M.

The George Washington University Hospital.—This 425-bed hospital is staffed and directed by the Faculty of The George Washington University School of Medicine. It provides excellent clinical opportunity for the instruction of medical students. Specialties in the fields of medicine and surgery have assigned space and equipment for the diagnosis and care of ambulatory and hospital patients.

Government Museums

The Armed Forces Institute of Pathology, on the grounds of Walter Reed Army Medical Center, affords unexcelled opportunity for study of conditions met in general medicine and surgery as well as those of special military significance. Its collection of anatomical and pathological specimens comprises material received from all areas of the world and is unequaled in this country. The Museum of Hygiene, the National Museum, the Smithsonian Institution, the Botanic Gardens, and the various collections of the Department of Agriculture all afford opportunity for study of materials of special interest in various areas of Medicine and its allied sciences.

CLINICAL FACILITIES

Students at The George Washington University School of Medicine receive clinical training at the University Hospital, at the University Cancer Clinic, and at affiliated hospitals.

The George Washington University Hospital.—The Medical Director and Chiefs of Services are responsible for the supervision of patient care. The individual student has direct responsibility to patients under supervision. Clinical and clinical pathological conferences are held in which the history of patients, laboratory records, and the physical and pathological findings are presented and correlated.

The University Clinics.—The University Clinics have facilities for each Service in the Hospital. Fourth-year students are assigned in rotation by section for instruction in the University Clinics.

The George Washington University Cancer Clinic.—The Helen L. and Mary E. Warwick Memorial Building, opened in 1954, houses the Cancer Detection Clinic and special laboratories for research related to the nature, diagnosis, and treatment of cancer.

The facilities of the Cancer Detection Clinic are used for teaching medical students. The diagnosis and treatment of various forms of neoplasms are presented. The results of treatment are evaluated by follow-up studies.

District of Columbia General Hospital.—The District of Columbia General Hospital, one of the ten largest general hospitals in the country, is a teaching facility for students of the School of Medicine.

The hospital has a bed capacity of approximately 1,400. It is the principal facility for the care of the indigent sick of the community. In 1960 the outpatient department had over 110,000 clinical visits. Approximately 200 patients are registered daily in the admitting and emergency service, of whom from 15 to 20 per cent are admitted to the Hospital. This is the largest emergency service in the District, and a great variety of acute medical problems and surgical cases are examined and treated. From 35 to 40 per cent of the patients are referred to the outpatient clinics for further diagnosis and treatment.

Children's Hospital.—This is one of the largest and best known hospitals for children in the United States. Medical students receive training and clinical experience in pediatrics on both clinic and inpatient services. Special lectures and clinical work in child psychiatry are given in Children's Hospital.

St. Elizabeths Hospital.—Saint Elizabeths Hospital, established by an act of Congress in 1855, is a federal psychiatric hospital administered under the Department of Health, Education, and Welfare. This Hospital provides for the treatment, care, and general well-being of approximately 8,000 patients. The facility includes a completely approved General Hospital to meet the needs for medical and surgical care and which functions with a full-time staff within the Hospital plus attending physicians in various specialties.

The Hospital maintains an up-to-date medical library.

The medical students of The George Washington University utilize the facilities of Saint Elizabeths for clinical psychiatric training.

The opportunities for research are enhanced by a cooperative arrangement with the National Institute of Mental Health of the United States Public Health Service.

Mt. Alto Veterans Administration Hospital.—This 335-bed hospital, commonly referred to as Mount Alto, is predominantly general medical and surgical, although 33 beds are reserved for the care of neurological and psychiatric patients.

The Hospital is equipped and operates with all modern facilities for care and treatment of patients, including a fully equipped medical library. In addition to its medical, surgical, neurological, and psychiatric facilities, the Hospital is desig-

nated to perform specialized treatment in a wide variety of fields. The psychiatric evaluation headquarters staff is located at this Hospital and has as its mission the investigation and evaluation of the psychiatric treatment program in the VA. The Hospital also has personnel assigned to, and cooperates closely with, the Armed Forces Institute of Pathology.

Fairfax Hospital.—This 300-bed suburban hospital which opened February 1961, is a teaching hospital serving an area with an estimated population of 300,000. In addition to its modernly equipped emergency room, outpatient facilities, surgical suites and delivery rooms, and private psychiatric unit, programs are offered for the training of nursing personnel.

ADMISSION

Application for Admission

1. Full directions for application will be furnished on request. The applicant should ask the registrar of each college previously attended to send an official transcript of record to the Director of Admissions, The George Washington University, 2029 G Street NW., Washington 6, D. C. Photostatic copies of credentials without the original signature of the certifying authority are not satisfactory. It is the responsibility of the applicant to see that all credentials are forwarded to the Director of Admissions of the University.

2. Two recent photographs, with signatures, are required of each applicant.

3. Applicants for admission are required to take the Medical College Admission Test, sponsored by the Association of American Medical Colleges, in advance of the academic year for which application is made.

4. A fee of $10 to defray the cost of completing the records for consideration by the Committee on Admissions must accompany each application. This fee applies to students whose premedical training was completed at this University as well as to students who have not previously attended this University.

Entrance Requirements

College Courses

Biology (including 4 hours of laboratory)	8
A course in either general biology or zoology	
Chemistry:	
Inorganic (including 4 hours of laboratory)	8
Qualitative analysis may be counted as part of this requirement.	
Organic (including laboratory)	6-8
The equivalent of a one-year college course	
English Composition and Literature	6
Physics (including at least 2 hours of laboratory)	8

With the exception of these specific requirements applicants are urged to follow their personal interests in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

While well-qualified candidates are eligible for admission after completing the minimal 90 semester-hour requirement, the majority of applicants are found to be better prepared for the study of medicine after four years of college work.

Advanced Standing

A student who has satisfactorily completed part of the requirements for the degree of Doctor of Medicine may apply for advanced standing if his work has been equivalent to that required by The George Washington University School of Medicine. Before final admission to the third year class, the applicant must have passed Part I of the National Board Examinations.

Selection Procedures

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed on invitation by the Committee.

Each applicant is notified of the Committee's decision as soon as possible.

An applicant who is offered a place in a class is required, within two weeks, to notify the Director of Admissions of his intent to accept the place reserved for him. A deposit of $100 must be remitted not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Director of Admissions by the student's physician within two months of receipt of the letter of acceptance.

REGISTRATION

For the academic year 1962–63, registration will be conducted at the Medical School, 1335 H Street NW., from 10:00 A.M. to 4:00 P.M., September 13. Registration is for a period of one academic year.

FEES AND FINANCIAL REGULATIONS

The following fees have been adopted:

Application fee	$ 10.00
Tuition fee, for each academic year	1,200.00
Fee for special examinations, for each subject	5.00
Residence fee, charged each student granted "leave of absence" status for the academic year in the School of Medicine	50.00
Graduation fee	25.00

Payment of Fees

Fees for the year are $1,200, payable in two installments of $600 each in advance of the beginning of each semester.

All fees are payable at the Office of the Cashier of the University, 725 Twenty-first Street, NW., except as some other arrangement may be announced. Amounts due must be paid on or before registration day for the fall semester and on or before such date as may be announced by the Office of the Treasurer for the spring semester. (See the Calendar.)

Registration in the School of Medicine is *for the full academic year.* After a student has entered the courses of instruction he is obligated for the full tuition.

Acceptance by the School of Medicine of a student's fees does not in any way obligate the School to accept the student for any subsequent year and the right is reserved to require the withdrawal of any student whenever, in the interest of the student or the School, the Faculty deems it advisable to do so.

Credit for work will not be given until, at the completion of a laboratory course, the student has replaced or paid for all articles of equipment or other University property which he has lost, broken, or destroyed.

Cost of Textbooks and Student Equipment

The minimum cost of necessary textbooks and student equipment (microscope, drawing materials, glass slides, clinical thermometer, stethoscope, hemocytometer, uniforms, etc.) is approximately as follows: first year, $600; second year, $275; third year, $150; fourth year, $100; total $1125.

A fee of $1 a semester is charged for the use (optional) of a locker.

SCHOLARSHIPS, PRIZES, FINANCIAL AID

The following scholarships, prizes, and loan funds are limited to students in the School of Medicine. The University offers many others which are open to medical students. A special bulletin containing a complete list and full information may be obtained from the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

Scholarships

Scholarships awarded to students in the School of Medicine are credited for the academic year unless otherwise specified. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded. Applicants must have established an academic record in courses at this institution, and should apply on prescribed forms which must be filed in the Office of the Chairman of the Committee on Scholarships not later than April 1 preceding the academic year for which the scholarship is to be awarded.

Anna Bartsch Hospital Intern Scholarship.—Established in 1946 by Dr. Anna Bartsch-Dunne as a memorial to her mother, Anna Bartsch, and available to a woman intern in The George Washington University Hospital. Award is made upon the recommendation of the Hospital's Internship Committee.

Anna Bartsch Medical Student Scholarship.—Established in 1946 by Dr. Anna Bartsch-Dunne as a memorial to her mother, Anna Bartsch, and available to a woman in the School of Medicine, "of outstanding scholarship, character, and promise, who intends to make the practice of medicine her life profession." The award is made upon the recommendation of the Faculty of the School of Medicine.

Everett Lamont Bradley Scholarship.—Established in 1954 by bequest of Alice R. H. Bradley in memory of her son, Everett Lamont Bradley, and available to a student in the School of Medicine.

Research Scholarships and Traineeships.—For student participation in the research programs of the School of Medicine or special training in research methods. Research scholarships are ordinarily awarded for full-time activity during the summer months; research traineeships support part-time work during the academic year. Scholars are "matched" with members of the faculty in accordance with their mutual interests. Trainees are designated by the departments responsible for the programs. These programs have been sponsored by the National Institutes of Health,

the National Foundation, Lederle Laboratories, and the Tobacco Industry Research Committee.

David Perry Steinman Memorial Scholarship Fund.—Established in 1960 by friends and classmates, and awarded annually to a sophomore in the School of Medicine on the basis of need and academic performance.

University Hospital Scholarships in Medical Technology.—Ten scholarships are available, each to cover the cost of 24 semester hours of the 30 in the last year of the curriculum leading to the degree of Bachelor of Science in Medical Technology.

Prizes

Allie S. Freed Prize.—Established in 1957 by Mrs. Allie S. Freed, and awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine.

Alec Horwitz Prize.—Established in 1959 by Dr. Alec Horwitz is awarded annually to a member of the senior class who has demonstrated exceptional proficiency in the field of surgery.

Huron W. Lawson Prize.—Established in 1957 by Mrs. Huron W. Lawson in memory of her husband, Dr. Huron W. Lawson, who was a distinguished member of the Medical Staff of The George Washington University, is awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Obstetrics and Gynecology.

Julius S. Neviaser Prize in Orthopedic Surgery.—Established in 1956 by Dr. Julius S. Neviaser, is awarded annually to the student in the junior class of the School of Medicine who scores the highest grade in a written examination in Orthopedics.

John Ordronaux Prize.—Awarded annually to the member of the graduating class of the School of Medicine who has the highest scholastic standing.

Financial Aid

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students to provide for partial payment of tuition. Applications for these loans must be made three days prior to the dates on which tuition installments are due.

Joseph H. Himes Loan Fund.—This fund contributed by Joseph H. Himes is available for loans to students in the School of Medicine.

Kellogg Medical School Loan Fund.—The W. K. Kellogg Foundation in Battle Creek, Michigan, has established a loan fund for students in the School of Medicine.

School of Medicine Loan Fund.—This fund, largely contributed by medical students, is available for loans to students in the School of Medicine.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms pre-

scribed for this loan fund must be filed in the Office of the Treasurer no later than July first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

Pfizer Medical School Loan Fund.—Chas. Pfizer & Co., Inc., has established a fund for loans to students in the School of Medicine.

Sutherland Medical School Loan Fund.—This fund, established by Mrs. Rose L. Sutherland, is available for loans to students in the School of Medicine.

REGULATIONS

Attendance

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required.

Grades

A—excellent; *B*—good; *C*—passing; *D*—condition; *F*—failure; *I*—incomplete. The passing grade in each subject is *C* or above.

The symbol *I* indicates that the required work of the course has not been completed for reasons acceptable to the Dean. An "incomplete" must be removed by arrangement with the department concerned before the student may advance to the work of the following year.

A student receiving a grade of *D* or *F* in any subject may not advance to the work of the following year until he has complied with such recommendations by the Committee on Scholarship as are approved by the Faculty.

Quality-Point Index

For purposes of quantitative evaluation of academic performance a "quality-point" index is computed on the basis of *A*, four points; *B*, three points; *C*, two points. If a condition, *D*, is removed one point is assigned. No points are assigned for a condition which is not removed or for a grade of *F*.

Examinations

Examinations, which may be written, oral, or practical, will be held during and at the end of each semester.

All students in the School of Medicine are required to take Part I and Part II of the National Board Examinations.

Graduation

Application for Graduation

Application for a degree should be filed in the Office of the Registrar by February 28 of the senior year.

Presence at Graduation

A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

Right to Dismiss Students

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable.

THE DEGREE OF DOCTOR OF MEDICINE

Upon the satisfactory completion of the requirements of the School of Medicine, the degree of Doctor of Medicine is conferred.

Combined Arts and Medicine Curriculum

In order to be recommended for the degree of Bachelor of Arts, the candidate must complete at least 90 semester hours of prescribed college work (at least 30 hours and one year of residence must be completed in Columbian College of Arts and Sciences) and the first year of the medical curriculum. Upon satisfactory completion of the fourth year of the medical curriculum the student becomes eligible for the degree of Doctor of Medicine.

REQUIREMENTS FOR THE DEGREE

Every candidate for graduation with the degree of Doctor of Medicine must be at least twenty-one years of age, and free of all indebtedness to the University. He must have completed satisfactorily not less than four academic years of study as a matriculated student in Medicine, completed all required courses, and passed satisfactorily all prescribed examinations.

Honors

A candidate who has completed the four-year medical course with a quality-point index of 3.50 or above, may be recommended by the Faculty for graduation "with distinction."

STUDENT LIFE

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. It also provides first aid in the event of an emergency.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or

* A charge for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

† See Rule (5) for exception.

breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits: (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

Physical Examinations

All first-year students are required to have a comprehensive physical examination prior to admission to the School of Medicine. The students are informed of significant findings and advised regarding such measures as will tend to help them maintain a high standard of health.

In addition medical students benefit from the complete Tuberculosis Case Finding Program which the School maintains. Under this program all students receive tuberculin tests, X-ray examinations, and such special attention from chest specialists as is necessary to reduce to a minimum the dangers from tuberculosis. Students are immunized against those diseases for which proven prophylaxis exists.

LIVING ACCOMMODATIONS

The University maintains five residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the dormitory only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Women Students.—Dolly Madison Hall provides double rooms at $40 a month a person.

Hattie M. Strong Hall provides single rooms at $47.50 a month and double rooms at $40 a month a person.

Men Students.—John Quincy Adams Hall provides double rooms each with study alcove and bath. Rooms rent for $40 a month a person.

Calhoun Hall provides double rooms at $40 a month a person.

Welling Hall provides double rooms at $30 a month a person.

HONOR SOCIETIES

Alpha Omega Alpha.—National Honor Medical Society. Members of the Junior and Senior classes meeting the qualifications specified by the constitution of the Society are eligible for election to membership.

William Beaumont Medical Society.—Medical students showing unusual ability for medical writing and research are elected by the active members of this society.

Howard Kane-A. F. A. King Obstetrical Society.—The fifteen students in the third and fourth year classes who maintain the highest grades in their work in obstetrics are eligible for membership.

Smith-Reed-Russell Society.—Students of the third and fourth years who maintain a scholastic average of 88 per cent are eligible for membership.

RECREATION

The nation's capital provides abundant recreational resources, a large number of which are available at little or no cost. There are numerous art galleries, museums, concert halls, theaters, swimming pools, parks, and places of great historic interest. There are, in addition, the usual commercial recreation facilities found in a large city. Social activities are provided by student organizations of the University, the School of Medicine, and University sponsored programs such as intramural sports, concerts, recitals, and dramatic productions. Almost every religious faith is represented in Washington by one or more churches, and much spiritual, educational, social, and recreational activity is conducted by the various church groups. There are many other cultural and educational facilities in Washington to meet almost any possible individual need or preference of a medical student and his family.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

THE UNIVERSITY HOSPITAL

The Medical Staff consists of the following groups: Emeritus, Honorary, University, and Courtesy.

Physicians on the faculty and staff of instruction of the School of Medicine are eligible for appointments to the University Hospital staff. The Administrator of the Hospital and the Director of Nursing are ex-officio members.

Office of the Medical Director

John Parks, M.D., *Medical Director*
Alvin Edward Parrish, M.D., *Co-ordinator of Clinical Activities*
Alfred Brigulio, M.D., *Secretary of the Medical Staff*
Clayton Bernard Ethridge, M.D., *Director of Post Graduate Medical Education*
Laura Beasley Brown, *Secretary, Office of the Medical Director*

Departments and Sections

Department of Anesthesiology: Charles Seymour Coakley, M.D., *Chief*
Department of Medicine: Thomas McPherson Brown, A.B., M.D., *Chief*
Section of Allergy: Halla Brown, M.D., *Chairman*
Section of Cardiology: John McCallum Evans, A.B., M.D., *Chairman*
Section of Dermatology: Harry Ford Anderson, M.D., *Chairman*
Section of Gastroenterology: Thomas Stone Sappington, A.B., M.D., *Chairman*
Section of Infectious Diseases: Monroe James Romansky, A.B., M.D., *Chairman*
Section of Internal Medicine: Clarence Richard Hartman, AB., M.D., *Chairman*
Section of Metabolic Diseases: Louis Katz Alpert, M.D., *Chairman*
Section of Pulmonary Diseases: James Joseph Feffer, A.B., M.D., *Chairman*
Department of Neurology and Neurological Surgery: James Winston Watts, M.D., *Chief*
Department of Obstetrics and Gynecology: Robert Henry Barter, B.S., M.D., *Chief*
Department of Ophthalmology: Ronald Atmore Cox, A.B., M.D., *Chief*
Department of Pathology and Clinical Pathology: Thomas Martin Peery, A.B., M.D., *Chief*
Department of Pediatrics: William Allen Howard, A.B., M.D., *Chief*
Department of Physical Medicine and Rehabilitation: Charles Samuel Wise, B.S., M.D., *Chief*
Department of Psychiatry: Leon Yochelson, A.B., M.D., *Chief*
Department of Radiology: William Woodrow Stanbro, M.D., *Chief*
Department of Surgery: Brian Blades, A.B., M.D., *Chief*
Section of General Surgery: Brian Blades, A.B., M.D., *Chairman*
Section of Oral Surgery: Karl Hayden Wood, Phar.G., D.D.S., *Chairman*
Section of Orthopedics: John Pletch Adams, B.S., M.D., *Chairman*
Section of Otorhinolaryngology: James Jerry McFarland, Jr., B.S., M.D., *Chairman*
Section of Plastic Surgery: Gordon Sparks Letterman, B.S., M.D., *Chairman*
Section of Urology: Leon Richard Culbertson, B.S., M.D., *Chairman*
Electroencephalographic Laboratory: Harold Stevens, Ph.D., M.D., *Director*
Heart Station: John McCallum Evans, A.B., M.D., *Director*
Outpatient Department: Clarence Richard Hartman, A.B., M.D., *Director*
Cancer Clinic: Calvin Trexler Klopp, A.B., M.D., *Director*
Cytology Laboratory: Lois Irene Platt, A.B., M.D., *Director*
Nursing: Margaret Emanuel, R.N., M.S., *Director*

COMMITTEES OF THE MEDICAL STAFF

Executive Committee

John Parks, *Chairman*

R. H. Barter, Brian Blades, Alfred Brigulio, T. M. Brown, C. S. Coakley, R. A. Cox, Margaret Emanuel, C. R. Hartman, W. A. Howard, V. F. Ludewig, A. E. Parrish, T. M. Peery, William Stanbro, J. W. Watts, C. S. Wise, L. T. Yochelson

Joint Conference Committee

T. M. Brown, W. A. Howard, V. F. Ludewig, John Parks, T. M. Peery

Medical Records Committee

P. C. Adkins, *Chairman*

Madeline Brown, S. W. Bush, F. P. Ferraraccio, J. W. Stites, *Chief Residents*

INTERN AND RESIDENT COMMITTEE

V. F. Ludewig, *Chairman*

P. C. Adkins, R. H. Barter, J. M. Evans, T. M. Peery

TISSUE COMMITTEE

W. S. McCune, *Chairman*

R. H. Barter, William Newman

CANCER COMMITTEE

C. T. Klopp, *Chairman*

L. K. Alpert, W. P. McKelway, William Newman, F. P. Ferraraccio, H. C. Pierpont, W. W. Saunders

PHARMACY COMMITTEE

W. R. Felts, *Chairman*

L. K. Alpert, F. D. Cooper, J. A. Dusbabek, J. M. Evans, C. R. Hartman, Louise O'Neal, J. R. Thistlethwaite

NURSING SERVICE COMMITTEE

Margaret Emanuel, *Chairman*

R. H. Barter, Brian Blades, T. M. Brown, V. F. Ludewig, A. E. Parrish, J. E. Rankin

UNIVERSITY HOSPITAL ADMINISTRATIVE STAFF

OFFICE OF THE ADMINISTRATOR

Victor Frederick Ludewig, B.S., *Administrator*
Fred Augustus Menk, *Associate Administrator*
Francisco Paolo Ferraraccio, B.S., *Assistant Administrator*
Raymond Francis Whitehair, *Administrative Assistant*
Rosina Orr Beaver, *Secretary, Office of the Administrator*
Sadie Estelle Oakley, *Chief, Admission Office*
Roger William Baker, B.S., *Assistant Comptroller*
Robert Hamilton Thompson, B.S., *Director of Food Service*
Joanne Louise Styer, B.S., *Chief Therapeutic Dietitian*
Charles Clark Hayes, *Executive Housekeeper*
Frank Leonard Sasher, *Manager, Laundry Department*
Madeline Lenora Brown, R.R.L., A.B., *Medical Record Librarian*
Margaret Ruth Emmanuel, R.N., M.S., *Director of Nursing*
Louise O'Neal, R.N., A.B., *Assistant Director of Nursing*
Laurence Edwin Johnson, A.B., M.H.A., *Administrative Assistant, Outpatient Department*
Franklin Dero Cooper, M.S., *Chief Pharmacist*
Thelma Moore, *Chief Telephone Operator*

THE GEORGE WASHINGTON UNIVERSITY HOSPITAL

The George Washington University Hospital, with a capacity of 427 beds, is a modern teaching facility for students of the School of Medicine and House Staff. Annual admissions number approximately 20,000; clinic visits are about 40,000 a year. The University Hospital is on Pennsylvania Avenue at Washington Circle.

It is fully approved by the American Medical Association, the American Hospital Association, the American College of Surgeons, and the Joint Commission for the Accreditation of Hospitals.

The Council on Medical Education and Hospitals of the American Medical Association and the various specialty boards have approved the University Hospital for residency training in anesthesiology, cardiac disease, internal medicine, neurology, neurological surgery, obstetrics-gynecology, pathology, physical medicine and rehabilitation, plastic surgery, psychiatry, radiology, surgery, and thoracic surgery. In addition, it has mixed internships majoring in medicine, pathology, and surgery.

Junior and senior students of the School of Medicine are assigned to the University Hospital as clinical clerks and in the outpatient department. Regular conferences for students, house staff, and attending physicians are held.

The George Washington University Cancer Clinic, housed in the nearby Helen L. and Mary E. Warwick Memorial Building is part of the University Hospital clinical facilities. Cancer detection and chemotherapeutic and follow-up care, including a supervised home-care program, are among the activities of the Clinic. Approximately 2,500 new patients are seen in the Cancer Clinic each year. Excellent research laboratories form an important part of this facility. The Clinic has been approved by the American College of Surgeons.

Other major teaching activities include a residency program in hospital administration; close affiliation with the University's graduate program in hospital administration; programs in Medical Technology leading to the Bachelor of Science degree as well as to a certificate; and an affiliation for the training of practical nurses.

The Hospital has an excellent branch medical library. The House Staff can also arrange to use libraries of the School of Medicine and the University and the outstanding city and federal libraries and record collections.

INTERN PROGRAMS

For 1962–63, the University Hospital will offer the following internships, classified by the National Intern Matching Program, Inc.: eight straight internships in Internal Medicine, eight mixed internships with Internal Medicine as the major component, twelve mixed internships with Surgery as the major component, and two straight internships in Pathology.

RESIDENT PROGRAMS

Fifty-five approved residencies are offered in anesthesiology, cardiac diseases, internal medicine, neurologic surgery, neurology, obstetrics-gynecology, orthopedic surgery, pathology, physical medicine, plastic surgery, psychiatry, roentgenology, surgery and thoracic surgery. Residency programs are from one to four years in duration, depending upon the service. Residents in the University Hospital also receive appointments as members of the faculty of the School of Medicine with active teaching responsibilities.

FELLOWSHIP PROGRAMS

Fellowships, through the School of Medicine, of one or two years are available in anesthesiology, cardiology, chest diseases, gastroenterology, hematology, infectious diseases, metabolic diseases, outpatient service, physical medicine, renal diseases, rheumatic disease, surgery and thoracic surgery.

All appointments are for one year with the privilege of applying for continuation on the House Staff. In several of the intern, residency, and fellowship programs, excellent affiliations are maintained with local and governmental hospitals. Inquiries and applications for internships and residencies should be addressed to the Chief of the Department or to the Medical Director; the George Washington University Hospital, 901 23rd Street, NW., Washington 7, D. C.

Information relative to fellowships may be obtained from the Chief of the Department concerned or from the Director of Postgraduate Medical Education, in care of the Hospital.

MEDICAL TECHNOLOGY COURSE

This course is open to candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College of Arts and Sciences, and to other applicants meeting the requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists. These requirements, fully satisfied by the Columbian College program, consist of 3 years (90 semester hours or 135 quarter hours) of college work in any college or university accredited by a recognized standardizing association, including certain specific courses in the science field. The specific science requirements are as follows: *Chemistry*—a minimum of 4 semesters or 6 quarters (16 semester hours or 24 quarter hours) of studies acceptable toward a major in chemistry and including lecture and laboratory; *Biologic Sciences*—a minimum of 4 semesters or 6 quarters (16 semester hours or 24 quarter hours) of studies acceptable toward a major in biologic science and including lecture and laboratory; *Mathematics*—a minimum of 3 semester hours or 4 quarter hours of college mathematics.

For students enrolled in Columbian College of Arts and Sciences as candidates for the degree of Bachelor of Science in Medical Technology, the Medical Technology Course constitutes the final (fourth) year of qualification for the degree.

In the case of those who have taken their prerequisite work in some other college or university, satisfactory completion of the Medical Technology Course will not satisfy the requirements for the degree from Columbian College.

The Medical Technology Course consists of 12 months of didactic and practical work in clinical laboratory procedures, offered by the Department of Pathology in the University Hospital. Students ordinarily begin this course with the fall semester, but under exceptional circumstances may begin at other times.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. (See page 30.) All students in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital. A cash allowance of $65 a month is granted during the last 6 months of the fourth year in training.

Upon satisfactory completion of the course a certificate is awarded and the candidate is eligible for the national certifying examination given by the Registry of Medical Technologists.

Enrollment in the Medical Technology Course is strictly limited so that personal instruction can be given. Acceptance to the Columbian College degree program does not necessarily assure acceptance into the Hospital program. Inquiry about this course should be sent directly to the Department of Pathology, The George Washington University Hospital, Washington 7, D. C.

COURSES OF INSTRUCTION

On the following pages of this BULLETIN, are listed the courses of instruction offered by the School of Medicine. The School of Medicine serves other divisions of the University by making available to nonmedical students certain undergraduate and graduate courses in the following fields: Anatomy, Microbiology, Biochemistry, Pathology, Pharmacology, Physical Medicine, and Physiology. The courses listed are subject to some slight change. The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS AND SYMBOLS

A number in parentheses after the name of a course indicates number of semester hours of credit which may be earned by nonmedical students.

First-year courses are numbered from 101 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and fourth-year courses, from 401 to 500.

Courses offered in the School of Medicine for nonmedical students.—Courses numbered from 101–200 are planned for upper-division students in undergraduate curricula. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction. Courses numbered from 201 to 500 are planned for graduate students.

ANATOMY *

Professors I. R. Telford *(Executive Officer)*, Paul Calabrisi
Professorial Lecturer T. D. Stewart
Associate Professors F. D. Allan, T. N. Johnson
Assistant Professors J. B. Christensen, J. C. Bartone
Clinical Instructors R. N. Brown, L. E. Church, L. C. Dearden

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Special Lecturer B. S. Blumberg

101–2 *Gross Anatomy* — Calabrisi and Staff

Academic year: fall—20 hours a week; spring—3 hours a week. Regional dissection of the human body, supplemented with lectures and quiz sections. Study of X ray anatomy to emphasize the functional aspects of the position, shape, and relation of the viscera and skeletal components.

103 *Human Embryology* — Allan and Staff

Spring—3 hours a week. The origin and development of the human body. Special emphasis on the value of embryology in interpreting anatomical anomalies and variations as seen in gross dissection, surgery, obstetrics, and pathology.

* The Staff of Instruction here listed is for the academic year 1961–62.

104 *Neuroanatomy* — Johnson and Staff

Fall—5½ hours a week. The macroscopic and microscopic study of the central nervous system and the special sense organs. Emphasis on such dynamic aspects as development, pathways, lesions, etc.

105 *Microscopic Anatomy* — Telford and Staff

Fall—9 hours a week. Study of the detailed minute structure of cells, tissues, and organs of the human body, with emphasis on the relation of structure to function. Recognition and interpretation of histological sections tested by practical examinations.

201–2 *Gross Anatomy* (8–2) — Calabrisi and Staff

Academic year—as arranged. For qualified nonmedical graduate students. Same as Anatomy 101–2. Anatomy 201—laboratory fee, $21; Anatomy 202—laboratory fee, $16.

203 *Human Embryology* (2) — Allan and Staff

Spring—as arranged. For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, $8.

204 *Neuroanatomy* (3) — Johnson and Staff

Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, $13.

205 *Microscopic Anatomy* (4) — Telford and Staff

Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, $13.

221–22 *Seminar* (1–1) — Telford and Staff

Academic year: 1 hour a week—as arranged. Research reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.

249–50 *Introduction to Medical Research** (3–3) — The Staff

Fall—Wed., 1:00 to 6:00 P.M.; spring—Wed., 8:00 A.M. to 2:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

295–96 *Research* (arr.) — The Staff

Academic year—as arranged. Fee to be arranged.

299–300 *Thesis* (3–3) — The Staff

ANESTHESIOLOGY†

Professors C. S. Coakley *(Executive Officer)*, Seymour Alpert
Clinical Professor D. H. Stubbs
Associate Professor C. R. MacCordy
Assistant Professors Paula Kaiser, Maria Benzinger
Assistant Clinical Professor S. N. Albert
Intructors H. E. Curtis, Helene Werner, Patricia Russell, Virginia Porter
Clinical Instructors W. E. Bageant, Allen Widome, Charles Gruenwald

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1961–62.

Fellows Marie-Louise Levy, Asakatsu Suzuki
Assistants Arsacio Abella, R. A. Hilloowala, Tetsuji Kiba, Arthur Peschin, Corazon Santiago, A. de J. Taboada, W. T. Wong

320 *Anesthesiology* — The Staff
Spring—1 hour a week. The fundamentals of anesthesia are reviewed and correlated with other medical specialties.

421–22 *Anesthesia Seminar* — The Staff
Academic year—1 hour a week. Students attend anesthesia seminars during their surgical clinical clerkships. University Hospital.

433–34 *Advanced Anesthesiology* — The Staff
Academic year—as arranged. Students are rotated through the work of the department for a period of two weeks and assigned to work in the operating rooms and to attend conferences and seminars. For the more advanced students a three-week elective is offered.

BIOCHEMISTRY*

Professors J. H. Roe *(Emeritus)*, C. R. Treadwell *(Executive Officer)*
Professorial Lecturers W. R. Carroll, Irving Gray, Arthur Weissbach
Associate Professor B. W. Smith
Associate Professorial Lecturer Leon Swell
Assistant Professors G. V. Vahouny, J. M. Bailey
Associate H. W. Clark, Jr.
Fellows Concordia Borja, R. R. Gray, R. M. Mayer, S. I. Sherr

113–14 *Biochemistry* — The Staff
Academic year: lecture (2 hours), conference (1 hour), laboratory (6 hours)—as arranged. Physiological and clinical chemistry. For medical students.

221–22 *Biochemistry* (4–4) — Vahouny
Academic year—Tues. and Thurs., 9:00 to 12:00 A.M. and 1:00 to 2:00 P.M. A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 22 and 152. Material fee, $15 a semester.

224 *Biochemistry of the Enzymes* (1) — Weissbach
Spring—Mon., 5:00 P.M. Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.

225–26 *Biochemical Procedures* (3–3) — Smith and Staff
Academic year—as arranged. A laboratory course. Material fee, $16 a semester.

227–28 *Biochemistry Seminar* (1–1) — The Staff
Academic year—Fri., 4:00 P.M. The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.

232 *Proteins and Amino Acids* (1) — Carroll
Spring—Wed., 5:00 P.M. A lecture course. Prerequisite: Biochemistry 113 or 221.

241 *Isotopes* (2) — Gray
Fall—Sat., 8:00 A.M. Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromotography.

* The Staff of Instruction here listed is for the academic year 1961–62.

249–50 *Introduction to Medical Research** (3–3) Bailey
Fall—Wed., 1:00 to 6:00 P.M.; spring—Wed., 8:00 A.M. to 2:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

251 *Carbohydrate Metabolism* (1) Roe
1962–63 and alternate years: Fall—Sat., 9:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

261 *Biochemistry of the Lipids* (1) Swell, Treadwell
Fall—Sat., 12:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

295–96 *Research in Biochemistry* (arr.) The Staff
Academic year—as arranged.

299–300 *Thesis* (3–3) The Staff

DERMATOLOGY AND SYPHILOLOGY†

Professor H. F. Anderson *(Executive Officer)*
Assistant Clinical Professors Hayden Kirby-Smith, J. Q. Gant, Jr., W. G. Ballinger
Associates W. M. Willett, Reuben Goodman, C. S. Brown
Clinical Instructor Manuel Landman

214 *Dermatology and Syphilology* The Staff
Spring—1 hour a week. Lectures on diseases of the skin and syphilis.

317–18 *Clinic* Brown
Case demonstrations, diagnosis, and treatment of skin diseases and syphilis. D. C. General Hospital.

407–8 *Clinic* The Staff
Two hours a week as arranged in rotation during academic year. Dermatology and syphilology in infants and children. Children's Hospital.

409–10 *Clinic* The Staff
Two hours a week as arranged in rotation during academic year. Clinical demonstrations, diseases of the skin. University Hospital.

MEDICINE†

Professors T. M. Brown *(Executive Officer)*, M. J. Romansky, L. K. Alpert, J. M. Evans, C. B. Ethridge
Associate Professors A. E. Parrish, C. R. Hartman
Associate Clinical Professors Pearl Holly, J. J. Feffer, A. G. Prandoni, Halla Brown, O. R. Farley, D. C. Sun, Janet Travell, T. S. Sappington
Assistant Professors S. W. Bush, W. R. Felts, Jr., G. A. Kelser, Jr., M. H. Jacobson, H. H. Orvis, Irene Siu, R. C. Fowler, Ariel Hollinshead *(Research)*, Mary Watt

* This is an interdepartmental course. The student should register in the department directing his research.
† The Staff of Instruction here listed is for the academic year 1961–62.

Assistant Clinical Professors J. A. Reed, T. J. Abernethy, Benjamin Manchester, J. E. Smith, J. W. Trenis, L. E. Putnam, Elizabeth Hill, J. E. Rall, L. J. Thomas, M. H. Stolar, Alfred Brigulio, S. J. N. Sugar, Joseph Ney, Joseph Beinstein, F. S. Bacon, H. D. Ecker, J. J. Rheingold, Irene Tamagna, J. W. Latimer, Jr., C. W. Jones, C. W. Thompson, E. S. Gladsden, Maurice Mensh, Arthur Rosenbaum, F. J. Murray, E. P. Parker III, M. H. Rosenberg, J. W. DuChez, W. O. Bailey, Jr., Milton Gusack, Jack Kleh, T. A. Gonder, Rashid Massumi, Ruth Benedict, H. M. Silver, H. E. Ticktin, J. P. Nasou, David Horwitz, B. C. Jones, Jr., E. L. Kehoe, R. F. Manegold, W. H. Whitmore, Jr.

Associates Maurice Protas, R. B. Castell, S. T. Gibson, R. B. Miller, Ernest Cotlove, T. J. Kennedy, Jr., Jack Orloff, J. B. Marbury, Louis Ross, F. D. Chapman, L. H. Snyder, R. G. Taylor, J. W. Long, Irvin Kerlan, Virginia Beelar, L. S. Blumenthal, S. W. Kirstein, J. F. Ambury, R. N. Coale, Israel Kessler, W. D. Brill, Marvin Fuchs, W. J. Weaver, Jr., J. T. Burns, T. L. Hartman, Boris Rabkin, M. H. Rose, C. A. Schulman, L. A. Craig, Jr., A. W. Danish, Adolph Friedman, Alvin Seltzer, S. D. Loube, Alfred Baer, Herbert Abramson, J. H. Pert, John Walsh, C. E. Law, E. L. Rea, J. P. Mann, Conrad Gossels, H. O. Mott, Bertle Nelson, W. J. Schewe, J. H. Watson, N. H. Rubenstein, D. M. Watkin, Edward Adelson, G. J. Fisher, W. L. Stone, B. H. Ostrow, C. D. Cooper, R. R. Belton, S. C. Pascoe, W. R. Ehrmantraut, C. A. Caceres, G. A. Chapman, F. M. Gross, Eleanor Makel

Instructors N. C. Kramer, W. F. Morrissey

Clinical Instructors E. H. Bauersfeld, H. C. Bates, Jr., Jeanne Bateman, George Sharpe, William Lewis, M. A. Sislen, C. J. Savarese, Jr., B. R. Cooperman, M. G. Sherer, J. C. Mandes, R. L. Howard, Walter Kurland, E. J. Leonard, R. S. Gordon, Jr., Jack Crowell, D. S. Davis, J. W. Roark, J. H. Epstein, G. C. Buchanan, F. K. Harris II, Audrey Connor, H. I. Passes, C. W. Foulke, Margaret McCabe, A. A. Lear, O. W. Donnelly, R. F. Dyer, R. S. Poole, P. R. Vagelos, H. C. Sadin, S. J. Talpers, G. T. Economos, Irwin Ardam, S. W. Dejter, S. E. Barr, H. A. Moskovitz, J. T. Hagenbucher, G. N. Polis, J. L. Clifford, Daniel Deykin, Catherine Ray, H. G. Rose

Fellows P. J. Carpentier, J. A. Jiminez-Guevara, Richard Kaufman, Yutaka Ohsaki, Vincent Pateras, A. L. Pinkerson, Andree Thomas, E. W. Walters, Leslie Wiener

Assistants Manuel Angoso-Dufoureq, R. A. Apter, F. J. Borsody, D. B. Cameron, S. J. Conway, D. W. Datlow, F. M. Downey, Jr., M. A. Eufemio, L. H. Fenton, A. S. Gooch, D. D. Haut, G. G Kay, Constance Lapointe, Gonzalo Lo, Herbert Lubowitz, Frederick Meyers, Hugh Miller, J. P. Mudry, Henry Schindelar, Barbara Solomon, M. F. Wildemann

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Special Lecturers A. D. Kistin, W. K. Myers, Sol Katz, R. W. Berliner, Henry Field, Jr., T. H. McGavack, P. D. Comanduras, W. L. Nalls, Roy Hertz, Albert Sjoerdsma, W. H. Crosby, D. S. Frederickson, Pierre Tulou, J. L. Goddard

106 *Living Anatomy* — The Staff

Spring—1 hour a week. An introduction to physical diagnosis, with special emphasis on topographical anatomy.

236 *Clinical Microscopy* — The Staff

Spring—3 hours a week. Conferences and studies in the clinical application of laboratory examinations of blood, body fluids, exudates, excreta.

242 *Physical Diagnosis* — The Staff
Spring—6 hours a week. Covers not only theoretical but practical application of principles of physical diagnosis as related to examination of patients.

243–44 *Introduction to Medicine* — The Staff
Academic year—2 hours a week. Lectures covering the principles of internal medicine preparatory to clinical studies and training in the inpatient and outpatient services.

325–26 *Clinical Clerkship* — The Staff
Eight weeks as arranged during academic year. Training with bed patients under individual instruction designed to develop ability in examination of patients and case taking as well as practice in clinical microscopy. D. C. General Hospital.

327 *Clinical Pathological Conferences I* — The Staff
Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are compared.

339–40 *Therapeutic Conferences* — Staff of Medicine and Pharmacology
Academic year—1 hour a week. Conferences designed to emphasize the application of pharmacological principles to the problems of clinical medicine. University Hospital.

349–50 *Medical Conferences* — The Staff
Academic year—2 hour a week. D. C. General Hospital.

421–22 *Outpatient Clinics* — The Staff
Six weeks as arranged during academic year. Individual case studies under personal supervision of the Staff. Daily clinics on current medical problems and seminars stressing physiological aspects of diseases. Individual examinations and instruction in medical specialties. University Hospital.

423–24 *Clinical Clerkship* — The Staff
Six weeks as arranged during academic year. University, Mt. Alto, and D. C. General hospitals.

427–28 *Clinical Pathological Conferences II* — The Staff
Academic year—1 hour a week. Continuation of Medicine 327.

429–30 *Clinical Pathological Conferences III* — The Staff
Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during their medical clerkships there.

MICROBIOLOGY *

Professors R. G. Beachley *(Emeritus)*, A. M. Griffin, Mary Robbins *(Acting Executive Officer)*, R. C. Parlett
Clinical Professor Murray Grant
Associate Professor Rudolph Hugh
Assistant Professor R. C. Wood
Clinical Instructor A. H. Traum
Associates W. D. Hann, G. B. Pelleu, Jr.
Fellows Mary Flesner, Julian Hoptman, J. W. Pearson

Special Lecturers L. S. Baron, R. C. Cook, C. W. Emmons, F. B. Gordon, Leon

* The Staff of Instruction here listed is for the academic year 1961–62.

Jacobs, M. C. Leikind, J. D. MacLennon, H. J. Magnuson, W. J. Peeples, G. O. Pierce

112 *General Microbiology* (4) — Hugh

Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M. For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications. Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11–12. Laboratory fee, $13.

209 *Medical Microbiology* (1 to 11) — The Staff

Fall: lecture (4 hours), laboratory (10 hours)—as arranged. Bacteria, rickettsia, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsia and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, $4.50 for each semester hour of laboratory work.

210 *Fundamentals of Epidemiology and Preventive Medicine* (2) — Grant

Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Microbiology 112 or 209.

219–20 *Advanced Microbiology* (arr.) — Hugh and Staff

Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Microbiology 112 or 209; Chemistry 151–52 or the equivalent; permission of the instructor. Laboratory fee, $4.50 a semester hour.

225 *Bacterial Chemistry and Physiology* (2) — Wood

1963–64 and alternate years: fall—as arranged. A lecture course in those areas of biochemistry peculiar to Class Schizomycetes, including discussion of the use of bacteria in the elucidation of biochemical problems. Prerequisite: Biochemistry 221–22 or the equivalent. A course in microbiology is recommended but is not essential.

232 *Immunological Methods* (3) — The Staff

1962–63 and alternate years: spring—as arranged. Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $11.

234 *Virology* (6) — Robbins

1963–64 and alternate years: spring—as arranged. Study of viruses and rickettsia. Lectures and laboratory exercises. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, $16.

240 *Advanced Epidemiology* (3) — The Staff

Spring—as arranged. Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Microbiology 210. Prerequisite: Microbiology 210.

249–50 *Introduction to Medical Research** (3–3) — The Staff

Fall—Wed., 1:00 to 6:00 P.M.; spring—Wed., 8:00 A.M. to 2:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

* This is an interdepartmental course. The student should register in the department directing his research.

293–94 *Staff Seminar* (1–1) — The Staff
Academic year as arranged. For graduate students. Bi-weekly throughout the year.

295–96 *Research in Microbiology* (arr.) — The Staff
Academic year—as arranged.

299–300 *Thesis* (3–3) — The Staff

401 *Public Health Practice* — Beachley and Staff
Fall—1 hour a week for 5 weeks. Study of public health practice at national, state, city, and county levels. Public and private agencies.

NEUROLOGY AND NEUROLOGICAL SURGERY*

Professors J. W. Watts *(Executive Officer)*, Harold Stevens
Associate Clinical Professors R. H. Groh, J. M. Williams
Assistant Clinical Professors J. P. Murphy, H. V. Rizzoli, A. S. Dekaban, Harvey Ammerman, G. J. Hayes
Associates G. D. Weickhardt, C. A. Marsan, A. J. Levens
Clinical Instructors M. C. Korengold, J. T. Lord, N. H. Horwitz, Z. W. Sanders, Ntinos Myrianthopoulos, R. H. Robertson, R. A. Mendelsohn, Ruth Jakoby, Virginia Duggins, L. C. McHenry, Jr., A. P. Hustead
Fellows Kristoff Abraham, J. L. Fox
Assistants R. J. Bortnick, H. Z. Gokalp

249 *Neurology: Basic* — Stevens, Williams
Fall—1 hour a week. Methods used to study the form and function of the nervous system. Lectures and laboratory demonstrations.

250 *Neurology* — Stevens and Staff
Spring—1 hour a week. Introductory lectures on clinical neurology with specimens, lantern slides, and motion pictures.

331 *Neurology and Neurological Surgery* — Watts, Stevens
Fall—1 hour a week. Clinical lectures and demonstrations.

333–34 *Neurology and Neurological Surgery, Clinical Clerkship* — Stevens, Williams, Ammerman
In conjunction with Neurology 335–36. Two weeks in rotation as arranged during academic year. Instruction in history, physical examination, ordinary clinical procedures. Attendance at neurosurgical operations. Six students in rotation. D. C. General Hospital.

335–36 *Neurosurgical Conferences* — Watts and Staff
Clinical conferences weekly. Six students in rotation. D. C. General Hospital.

431–32 *Neurology and Neurological Surgery Clinic* — Levens, Rizzoli
Two hours a week for three weeks in rotation as arranged during academic year. Neurological outpatient clinic. Consultation of staff on ambulatory cases, demonstration of diagnostic procedures. Six students in rotation. University Hospital.

433–34 *Clinical Neurology* — Groh, Sanders
Two hours a week for three weeks in rotation as arranged during academic year. Neurological inpatient examinations and demonstrations. Six students in rotation. St. Elizabeths Hospital.

* The Staff of Instruction here listed is for the academic year 1961–62.

435–36 *Neurological Surgery (elective)* — The Staff
Academic year—bi-monthly Lectures and motion picture demonstration of neurosurgical problems.

OBSTETRICS AND GYNECOLOGY*

Professors John Parks, R. H. Barter *(Executive Officer)*
Clinical Professor George Nordlinger
Associate Clinical Professor S. M. Dodek
Assistant Professors J. G. Sites, W. P. McKelway
Assistant Clinical Professors J. K. Cromer, J. A. Dusbabek, C. K. Fraser, Caroline Jackson, T. M. Leonard
Associates B. W. Richwine, F. S. Rogers, R. M. Roll, W. T. Lady, J. W. Pearson, Jr., Shirley Martin, N. J. Price, T. A. Wilson, M. S. Kaufman, M. P. Footer, J. C. Walsh
Clinical Instructors J. R. Epstein, S. H. Shea, A. S. Bright, R. E. Bieren, Donald Walters, J. M. Friedman, L. M. Liverett, W. H. Cooper, Peter Soyster, H. P. Treichler, I. W. Rovner, M. W. Sandmeyer, Jr., N. M. Tart, Elizabeth Crisp, L. W. Davis, J. F. Pauly, A. W. Winshel
Assistants R. J. Abaunza, S. M. Belinsky, D. R. Carlson, E. E. Cunningham, R. V. Erkenbeck, E. R. Kolvereid, J. R. Marshall, H. E. Olson, L. B. Outlar, Geraldine Paul, C. M. Tyndal

254 *Introduction to Obstetrics and Gynecology* — Dodek, Fraser
Spring—1 hour a week. Lectures and demonstrations on the development and physiology of the female reproductive system and management of normal pregnancy.

301–2 *Manikin Demonstrations* — Footer, Friedman
One hour a week for six weeks in rotation as arranged during academic year. The mechanism of labor and various types of operative delivery demonstrated to sections of the junior class. D. C. General Hospital.

337–38 *Obstetrics and Gynecology* — Parks, Barter, Sites, McKelway
Academic year—2 hours a week. Lectures and demonstrations on the principles of obstetrics and gynecology.

351–52 *Clinical Clerkship* — The Staff
Four weeks during academic year as arranged. Clerkship with patients, including ward rounds, operating room demonstrations, and weekly clinic. D. C. General Hospital.

441–42 *Clinical Obstetrics* — The Staff
Academic year—as arranged. Students participate in prenatal and postnatal clinic care, observe the course of labor and deliver patients under supervision, attend bi-weekly departmental conferences and daily ward rounds in the University and D. C. General hospitals.

443–44 *Clinical Gynecology* — The Staff
Six weeks in rotation as arranged during academic year. Students observe and participate in the gynecological clinics and operating rooms of the University and D. C. General hospitals.

* The Staff of Instruction here listed is for the academic year 1961-62.

OPHTHALMOLOGY *

Professor R. A. Cox *(Executive Officer)*
Clinical Professor E. A. W. Sheppard
Assistant Clinical Professor R. W. Wilkinson
Associates W. J. Romejko, W. P. Chalfant, Jr., W. J. G. Davis, R. E. duPrey, Robert Day, M. G. Alper
Clinical Instructors J. H. Lodge, W. B. Glew, J. R. Weimer, J. W. McTigue

352 *Ophthalmology* — The Staff
Spring—one hour a week for sixteen weeks as arranged. Lecture course presenting aspects of all the principles of ophthalmology.

447–48 *Clinic* — The Staff
Academic year—as arranged. Each student is given individual instruction in ophthalmological diagnosis.

OTOLARYNGOLOGY*

Associate Clinical Professor J. J. McFarland, Jr. *(Executive Officer)*
Assistant Clinical Professors Catharine Birch, J. L. Levine
Associates M. E. Krucoff, W. B. Walters, R. S. Page, Jr., J. A. Sabri, W. M. Trible

351 *Otolaryngology* — The Staff
Spring—1 hour a week for fourteen weeks. Lectures and demonstrations on anatomy, physiology, and diseases of the ear, nose, and throat.

354 *Bronchoscopy* — The Staff
Spring—1 hour a week for two weeks. A series of lectures on the fundamental principles and the use of instruments, including both the bronchoscope and esophagoscope.

355–56 *Clinic* — The Staff
One and one-half hours a week in rotation as arranged during academic year. Practical and clinical instruction in the diagnosis and treatment of diseases of the ear, nose, and throat. University Hospital.

PATHOLOGY *

Professors T. M. Peery *(Executive Officer)*, W. R. Duryee *(Research)*
Clinical Professor D. L. Weiss
Associate Professors F. N. Miller, Jr., William Newman, W. L. Marsh
Assistant Professors Lois Platt *(Cytology)*, Alexander Breslow, John Culberson

Special Staff for Demonstrations

Associate Clinical Professors J. S. Howe, E. F. Geever, R. G. Gottschalk
Assistant Clinical Professors R. E. Palmer, W. F. Enos, Cornelia Hoch-Ligeti
Associates L. E. Zimmerman, L. W. Fix, C. B. Cook

* The Staff of Instruction here listed is for the academic year 1961–62.

Clinical Instructor D. R. Parkinson
Assistants Gloria Brennan, Victor Fazekas, German Lasala, R. V. Rosvoll, Joan Turkus

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Special Lecturers E. B. Helwig, L. C. Johnson

115–16 *Introduction to Medical Science* (1–1) — Marsh and Staff
Academic year—1 hour a week. For students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.

117–18 *Principles in Medical Technology* (4–4) — Marsh and Staff
Academic year—4 hours a week. For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry, clinical bacteriology, serology, hematology, and clinical microscopy.

119–20 *Medical Technology Laboratory* (10–10) — Marsh and Staff
30 hours a week for 50 weeks. Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.

259–60 *Pathology* — Peery, Miller
Fall—9 hours a week; spring—3 hours a week. General pathology of inflammations, degenerations, malformations, and neoplasms. Special pathology of the organs and specific diseases. The laboratory work consists of the gross and microscopic study of diseased tissue. Special emphasis is placed on the functional effects of the various pathologic changes and their correlation with symptoms and physical signs.

261–62 *Necropsy* — The Staff
Academic year—as arranged. Students are required to attend and assist in the performance of necropsies at the University Hospital.

263–64 *Demonstrations in Pathology* — Special Staff
Academic year—1 hour a week. Gross specimens from several hospitals are demonstrated and discussed.

267–68 *Seminars in Pathology* — The Staff
Academic year—as arranged. Advanced lectures are presented as arranged on special topics in pathology.

270 *Forensic Pathology and Medical Jurisprudence* — Miller
Spring—1 hour a week. Forensic pathology, toxicology, chemistry, and immunology. The legal and ethical rights and responsibilities of physicians. Legal problems in medicine.

323–24 *Surgical Pathology I* — Weiss
Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing current surgical specimens.

327 *Clinical Pathological Conferences I* — The Staff
Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are correlated.

427–28 *Clinical Pathological Conferences II* — The Staff
Academic year—1 hour a week. Continuation of Pathology 327.

429–30 *Clinical Pathological Conferences III* — The Staff
Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during the medical clerkship there.

492 *Surgical Pathology II* — Newman
Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

493–94 *Pathology Clerkship (elective)* — The Staff

Academic year—as arranged. A limited number of students receive individual training in surgical pathology and necropsies in the laboratories of the University Hospital.

PEDIATRICS *

Clinical Professors Margaret Nicholson, W. S. Anderson, R. H. Parrott, L. E. Hoeck, W. A. Howard *(Executive Officer)*

Associate Clinical Professors J. A. Washington, R. S. Lourie, T. E. Reichelderfer

Assistant Clinical Professors Margaret Gutelius, Mabel Grosvenor, Aaron Nimetz, George Maksim, A. B. Coleman, R. E. Martin

Associates J. H. Peacock, Jr., Mary Startwell, C. F. Stiegler, H. G. Clark, Adrian Recinos, Jr., C. R. Webb, William Stark, A. R. MacPherson, S. L. Leikin

Clinical Instructors H. H. Diamond, R. H. Mitchell, R. O. Warthen, Emilie Black, R. H. Anderson, W. G. Preisser, Bennett Olshaker, H. T. Yates, Roger Bergstrom, G. J. Cohen, M. S. Glatt, Mary Fox, S. Z. Goldblatt, Harold Plotsky, J. R. Puig, Jean Lockhart, G. W. Daisley, Jr., T. H. Anders, Sidney Levin

Assistants F. W. Floyd, Jr., E. W. Lovrien, R. E. Stang, A. H. Topchik, Pija Charif

256 *Pediatrics* — Howard and Staff

Spring—2 hours a week. Lectures on physiology of the newborn, normal behavior, emotional and physical development, infant nutrition, diseases of the newborn, common anomalies and system illnesses of infancy and childhood. Medical School.

355–56 *Pediatrics* — Howard and Staff

Continuation of 256, with increasing emphasis on pathologic disease states, stressing pathophysiology and treatment.

357–58 *Clinical Clerkship: General Pediatrics* — Reichelderfer and Staff

Two weeks as arranged during academic year. Introduction to clinical pediatrics. Emphasis on bedside discussion and group seminars including the newborn. Ward rounds. Five students in rotation. D. C. General Hospital.

359–60 *Clinical Clerkship: Contagious Diseases* — Reichelderfer and Staff

Two weeks as arranged during academic year. Conferences and bedside discussion on contagious and infectious diseases. Prevention and quarantine measures. Five students in rotation. D. C. General Hospital.

361–62 *Clinical Conferences I* — Reichelderfer and Staff

Academic year—1 hour a week. Required. Presentation and discussion by students of current patient problems. D. C. General Hospital.

363–64 *Ward Rounds* — Reichelderfer and Staff

Academic year—as arranged. Bi-weekly ward rounds, with students and Resident Staff. D. C. General Hospital.

365–66 *Pediatric Psychiatry* — Lourie and Staff

Academic year—as arranged. Lectures on neuroses of children and adolescents (in cooperation with the Department of Psychiatry).

457–58 *Clinical Clerkship* — Howard and Staff

Six weeks as arranged during academic year. Full time, including assignment to night and holiday admissions. Case studies on wards under direct Resident supervision. Ward rounds with Staff and Residents. Twelve students. Children's Hospital.

* The Staff of Instruction here listed is for the academic year 1961–62.

459–60 *Outpatient Clinics* — Howard and Staff
Academic year—as arranged. Work in Medical and Specialty clinics including surgery, allergy, X-ray, child welfare, cardiology, dermatology, neurology, and child guidance. Children's Hospital.

461–62 *Clinical Pathological Conferences* — Howard and Staff
Academic year—1 hour a week. Clinical and pathological discussion of recent patient history and laboratory data. Medical School.

463–64 *Teaching Rounds* — Gutelius and Staff
Academic year—three times a week. Discussion of clinical problems of diagnosis and treatment of current patients. Children's Hospital.

465–66 *Section Conferences* — The Staff
Academic year—1 hour a week. Surgical diagnosis, pre- and post-operative management. Children's Hospital.

467–68 *Clinical Conferences II* — Howard and Staff
Academic year—1 hour a week. Required. Staff and student discussion of current problems in pediatrics with review of recent literature. Children's Hospital.

469–70 *Clinical Pediatric Psychiatry* — Lourie and Staff
Academic year—as arranged. Clerkship in fourth year including Well Baby Clinic. Group and class conferences.

PHARMACOLOGY *

Professor H. G. Mandel *(Executive Officer)*
Clinical Professor R. G. Smith
Professorial Lecturer B. B. Brodie
Associate Professor Clarke Davison
Assistant Professors V. H. Cohn, Jr., T. M. Farber, Paul Mazel, Melvin Reich *(Research)*, J. F. Henderson *(Research)*, George Fiala *(Research)*
Teaching Fellow Robert Tomchick

249–50 *Introduction to Medical Research*† (3–3) — The Staff
Fall—Wed., 1:00 to 6:00 P.M.; spring—Wed., 8:00 A.M. to 2:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

261 *Pharmacology* (5) — The Staff
Fall—5 hours a week. Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students.

262 *Pharmacology* (1) — The Staff
Spring—1 hour a week. Continuation of Pharmacology 261. Pharmacological uses of normal body constituents.

263 *Pharmacology Laboratory* (1) — The Staff
Fall—3 hours a week. Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students.

* The Staff of Instruction here listed is for the academic year 1961–62.
† This is an interdepartmental course. The student should register in the department directing his research.

267–68 *Pharmacological Research* (arr.) — The Staff
Academic year—as arranged. Primarily for those properly qualified graduate and medical students seeking careers in pharmacology.

269–70 *Pharmacology Seminar* (1–1) — The Staff
Academic year—2 hours a week. Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students.

279–80 *Mechanism of Drug Action* (1–1) — The Staff
Academic year—as arranged. A course to familiarize the student with advanced biochemical, microbiological, and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students.

299–300 *Thesis* (3–3) — The Staff
Academic year—as arranged. Required of Master of Arts and Master of Science candidates.

PHYSICAL MEDICINE AND REHABILITATION *

Professor C. S. Wise *(Executive Officer)*
Assistant Professor John Watt, Jr.
Associates A. B. C. Knudson, F. L. Wenger
Assistants Jessie Fair, Kyoko Ikari

150 *Elements of Physical Medicine* — The Staff
Spring—as arranged. In arangement with the Anatomy Department, lectures and demonstrations of the various tests and measurements are employed in the evaluation of physical disability.

352 *Advanced Physical Medicine* — The Staff
Spring—1 hour a week. Lectures and demonstrations concerning the various techniques, clinical applications of physical medicine and rehabilitation to be integrated with the teaching of the associated medical and surgical specialties.

467–68 *Clinical Studies (elective)* — The Staff
Academic year—as arranged. Clinical teaching and demonstration at the University Hospital.

485 *Research* (arr.) — The Staff
Fall—as arranged. Open to medical students and qualified nonmedical students.

PHYSIOLOGY *

Professors C. E. Leese, E. M. Renkin *(Executive Officer)*
Associate Professor F. P. J. Diecke
Assistant Professors Ruth McClintock, C. S. Tidball *(Research)*
Lecturers Eugene Braunwald, J. F. Hoffman, D. P. Rall
Associates Saul Winegrad, Margaret Westecker, Elizabeth Tidball, K. A. Hubel, P. G. Nelson, J. H. Mitchell, W. B. Wood

* The Staff of Instruction here listed is for the academic year 1961–62.

Special Lecturers S. J. Sarnoff, J. H. U. Brown

115 *Physiology* (3) — Leese

Fall: section A—Tues. and Thurs., 8:45 to 10:00 A.M.; section B—Tues. and Thurs., 5:10 to 6:25 P.M. Lectures for nonmedical students covering the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of a biological science. Prerequisites and time subject to change 1961–62.

117 *Experimental Physiology* (1) — The Staff

Fall—Fri., 2:10 to 5:10 P.M. Laboratory exercises in the fundamentals of physiology for nonmedical students. Prerequisite or concurrent registration: Physiology 115; or the equivalent. Material fee, $18. Prerequisites and time subject to change 1961–62.

120 *Physiology of Endocrine Activity* (2)

Not offered 1961–62. For nonmedical students. The circulatory, metabolic, reproductive growth, and other adaptations immediate and long term, accompanying and affecting endocrine activity. Prerequisite: Physiology 115 or the equivalent.

130 *The Psycho-physiology of Personality* (2) — Leese

Spring—Tues. and Thurs., 5:10 P.M. For nonmedical students. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.

150 *Medical Physiology* — Renkin and Staff

Spring—18 hours a week. Lectures and laboratory work in all divisions of Physiology. This course is designed for medical students.

211–12 *Problems in Physiology* (arr.) — The Staff

Academic year—as arranged. For nonmedical graduate students. Open to undergraduate students with the approval of the Department. Prerequisite: Physiology 115 and 117, or the equivalent.

221–22 *Physiology Seminar* (1–1) — The Staff

Academic year—1 hour a week, as arranged. For nonmedical students undertaking graduate work in physiology. Prerequisite: Physiology 115 and 117, or the equivalent.

232 *Advanced Physiology* (12) — Renkin and Staff

Spring—18 hours a week, as arranged. Lectures and laboratory work in all divisions of Physiology. For nonmedical graduate students.

249–50 *Introduction to Medical Research** (3–3) — The Staff

Fall—Wed., 1:00 to 6:00 P.M.; spring—Wed., 8:00 A.M. to 2:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, $7.50 a semester.

269–70 *Pharmacologic Physiology* (1–1) — The Staff

Academic year—one hour a week, as arranged. Recent advances in physiology and pharmacology for those interested in research. Open to qualified medical and nonmedical students.

279 *Topics in Physiology* (1) — The Staff

Fall—one hour a week, as arranged. Review of the active areas of research. Open to qualified medical and graduate students. Prerequisite: Physiology 150 or 232.

295–96 *Research* (arr.) — The Staff

Academic year—as arranged.

299–300 *Thesis* (3–3) — The Staff

*This is an interdepartmental course. The student should register in the department directing his research.

PSYCHIATRY *

Professors Winfred Overholser *(Emeritus)*, Leon Yochelson *(Executive Officer)*, Samuel Yochelson *(Research)*

Clinical Professors Joel Elkes, J. D. Schultz, D. C. Cameron, F. A. Freyhan

Associate Professor J. E. Rankin

Associate Clinical Professors H. P. Laughlin, M.deG. Ruffin, Sidney Berman, Morris Kleinerman, Anna Todd, Norman Taub

Assistant Clinical Professors Harold Corson, Sarah Tenenblatt, Richard Schaengold, Leon Ferber, P. H. Gray, David Eden, C. T. Bever, C. E. Goshen, Joseph Abrahams, Paul Chodoff, R. M. Greenberg, Helen Pallister

Associates W. C. Johnson, W. D. Kehne, H. A. Meyersburg, R. A. Rogers, J. A. Farrell, S. C. Gordon, H. B. Lehrman, R. A. Frank, Helen Pearcy, A. M. Drummond, G. W. Sprehn, N. C. Rintz, Leslie Schaffer, J. L. Sheridan, L. J Duhl

Clinical Instructors Maxwell Boverman, G. W. Metcalf, S. L. Werkman, D. W. Harris, A. H. Kiracofe, Jr., T. M. Mackenzie, B. W. Murphy, Daniel Prager, F. N. Waldrop, J. H. Bouma, Jean Menetrez

Assistant A. A. Cairo

Special Lecturers R. H. Felix, Mathew Ross

165 *Introductory Medical Psychology* — Berman

Fall—1 hour a week. An orientation course in the anatomical, physiological, and psychological growth and development of personality. Consideration of characteristics of structure, function, and development of the psyche leading to normal behavior as a basis for the study of the pathological. Evaluation of interpersonal relationships.

178 *Psycopathology* — Rankin

Spring—1 hour a week. Manifestations and understanding of various mental mechanisms and abnormal reaction-types, preceded by history of development of psychopathology and illustrated with case material.

266 *Psychiatry* — Yochelson

Spring—1 hour a week. Psychiatry in the practice of Medicine. Techniques of interviewing.

268 *Demonstration Clinics* — The Staff

Spring—3 hours a week. History, etiology, symptoms, course, and treatment of the major psychoses with emphasis on the dynamics involving the person as a whole. Presentation of clinical cases of major mental illnesses and primary behavior disturbances. St. Elizabeths and D. C. General hospitals.

272 *Psychosomatic Aspects of General Medicine* — Ruffin

Spring—1 hour a week. Somatic disorders of psychogenic origin. The role of personality reactions in functional and organic disorders.

324 *Psychoneurosis* — Ferber

Spring—1 hour a week. Etiology, psychopathology, clinical aspects, and treatment of various types of psychoneuroses. Medical Conference Room, D. C. General Hospital.

431–32 *Clinical Clerkship* — The Staff

Three weeks divided service as arranged during academic year. Supervised examination, diagnosis, and treatment of ambulatory cases in University Hospital and hospitalized cases in St. Elizabeths Hospital. Conferences for discussion of cases.

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* The Staff of Instruction here listed is for the academic year 1961–62.

Clinical application of psychiatric principles to general medical practice is stressed. University Hospital Inpatient and Outpatient Psychiatric clinics and St. Elizabeths Hospital.

RADIOLOGY *

Professor W. W. Stanbro *(Executive Officer)*
Assistant Professor W. W. Saunders
Assistant Clinical Professors Charlotte Donlan, S. R. Bersack, H. J. Kicherer, H. L. Berman, J. A. Isherwood, E. R. King, J. T. Brennan
Associates A. C. Wyman, S. W. Smith
Instructor C. F. Murphy
Clinical Instructors George Tievsky, U. V. Wilcox II, C. M. Weber, Nan Van Wagenen, Zeki Erim
Assistants Palma Abraham, A. S. Cigtay, H. M. Hagen, C. J. Kim, Margaret Mones, W. J. Nelson, L. N. Sweet

115–16 *Anatomy* — The Staff
Academic year—as arranged. Correlation of gross and Roentgen anatomy.

220 *Principles of Radiology* — The Staff
Spring—1 hour a week. Lectures and discussions.

313 *Advanced Radiological Diagnosis* — The Staff
Fall—as arranged. Lectures and discussions.

421–22 *Clinical Studies* — The Staff
Students are assigned to the X-ray Department in rotation on a full-time basis for a specific period.

SURGERY *

Professors Brian Blades *(Executive Officer)*, C. T. Klopp
Clinical Professors W. S. McCune, V. M. Iovine, Alec Horwitz, G. A. Higgins, Jr., J. P. Adams, G. S. Letterman
Associate Professors P. C. Adkins, H. C. Pierpont
Associate Clinical Professors H. L. Feffer, J. R. Thistlethwaite, Don Wenger
Assistant Professor N. P. D. Smyth, T. C. Alford
Assistant Clinical Professors B. F. Dean, Jr., Carl Berg, J. S. Neviaser, J. B. Harrell, L. T. Peterson, Thomas Bradley, Murdock Head
Associates W. R. Morris, J. J. Weinstein, W. C. Meloy, K. H. Wood, Isabella Harrison, Maxine Schurter, Charles Keck
Instructor W. J Cushing
Clinical Instructors C. D. Briggs J. F. Conlon, D. C. Richtmeyer, Leon Gerber, E. A. Gould, A. B. Rohrbaugh, Jr., M. H. Kendrick, B. G. Brown, J. D. Hoyle, R. R. Smith, N. H. Isaacson, C. S. White, Jr., D. P. McCarty, J. M. Keshishian, R. L.

* The Staff of Instruction here listed is for the academic year 1961 62.

THE SCHOOL OF MEDICINE RECORD

1961–62

DEGREES CONFERRED

Doctor of Medicine

June 7, 1961

Mahmmed Akbarian — Iran
A.B. 1957, The George Washington University

Burton Norman Alter — Va.
B.S. 1958, Yale University

Robert Lee Altman — Md.
B.S. 1957, Westminster College

Arthur James Anderson — D.C.

Scott Wayne Ankeny — Md.
A.B. 1954, The George Washington University

Lucy Denise Antoniou — D.C.
A.B. 1958, The George Washington University

Roger Morris Atwood — Minn.
A.B. 1957, Carleton College

Howard Samuel Baer — Conn.
A.B. 1957, Wesleyan University

Robert Miller Barnhart — Md.

Mason Barr, Jr. — D.C.
A.B. 1957, Haverford College

John Albert Beeman — Calif.
A.B. 1958, Occidental College

Dale Roger Bertsch — Va.

Delano Woodrow Bolter — Calif.

Violet Ella Bowen — W.Va.
A.B. 1958, The George Washington University

Robert Camio Calvo — N.J.
B.S. 1956, Rutgers University

Constance Joan Campbell — Va.
A.B. 1958, The George Washington University

Clyde Frank Chambers, Jr.

John Peter Clay — Md.
A.B. 1956, Occidental College

Allan Barry Cohan — Calif.
A.B. 1957, The George Washington University

Thomas Grosvenor Colmey — D.C.
A.B. 1957, Duke University

Justin Lyle Conrad — Ill.
A.B. 1957, Northwestern University

Jack Phillip Covell — N.D.

Irvin Jack Cowley — Ind.

Francis Gene Dahlke — Utah

Jack Tom Dancer — Wis.
B.S. 1957, University of Arizona

Paul Roger DeMordaunt — Ariz.

Robert Arthur Derro — Idaho
A.B. 1957, Harvard University

Vincent Theodore DeVita, Jr. — Mass.
(With distinction)
B.S. 1957, College of William and Mary

John Albert Dolan — N.Y.
B.S. 1957, Georgetown University

Ronald Edward Dunn — Md.
B.S. 1957, University of Idaho

Peter Alan Fleming — Idaho
A.B. 1956, San Diego State College

Morton George Fried — Calif.
(With distinction)
A.B. 1957, New York University

Milton Gallant — N.Y.
A.B. 1957, Rutgers University

Ray Fillmore Garman — N.J.
A.B. 1957, Johns Hopkins University

Francis Kenneth Gates, Jr. — Va.
A.B. 1956, Occidental College

Henry Smither Gering — Calif.
B.S. 1957, The Citadel

Andrew Manuel Giovannini — D.C.
A.B. 1957, University of California

Ronald Milton Graham — Calif.

Thomas Hamlin Gresinger — Wash.
A.B. 1957, Williams College

Carl Richard Guiton — D.C.
A.B. 1957, Columbia University

Clayton Allan Hixson — N.J.
B.S. 1957, Fairmont State College

William Francis Hogan — D.C.
A.B. 1958, The George Washington University

Kin Lincon Hung — Va.
B.S. 1957, University of Maryland

William Clymer James — D.C.
A.B. 1954, Harvard University

John Howard Jennings — D.C.
A.B. 1957, Central College

Bruce McCoy Johnson — Mo.
A.B. 1957, Carleton College

Robert Katz — Ohio

Barry Melvyn Kaufman — D.C.
B.S. 1958, University of Wisconsin

Frank Jay Keefer — N.Y.
A.B. 1957, Washington and Jefferson College

Robert John Kelly — W.Va.
A.B. 1958, University of Missouri

Lois Estelle Knapp — Va.
B.S. 1958, Gustavus Adolphus College

Norman John Knorr — D.C.

Ronald Gordon Latimer — Md.
A.B. 1958, The George Washington University

George Lamoyne Lucas — D.C.
A.B. 1957, Ohio University

Margaret Mary Maggio — Ohio

Robert Powell Majors, Jr. — N.J.
B.S. 1957, Davidson College

John Lloyd Marlow — N.C.
B.S. 1957, Brigham Young University

James Kent Mason — Idaho
A.B. 1959, Montana State University

Jacob Lenhardt Mathis, Jr. — Va.
A.B. 1957, University of California

Samuel Frank Mazella — Calif.

A.B. 1957, Cornell University — N.J.

Francis Donald McGuire — N.J.
A.B. 1957, New York University

Donald McKay — Mass.
(With distinction)
A.B. 1955, Harvard University

Jay Howard Miller, Jr. — Md.
B.S. 1957, The George Washington University

Valery Thornton Miller — D.C.
A.B. 1958, The George Washington University

Allen Mendel Mondzac — Md.
(With distinction)
A.B. 1958, The George Washington University

James Reardon Moore, Jr. — Md.
B.S. 1957, The George Washington University

Thomas Edison Morledge — Mont.

B.S. 1955, University of Arizona — Va.

Charles Nemeth — D.C.

Donald Owen Nutter — N.Y.
A.B. 1957, Johns Hopkins University

Charles Burton Radlauer — Puerto Rico

Fernando Enrique Ramirez — Md.
A.B. 1958, The George Washington University

Richard Curtis Rehmeyer
A.B. 1957, Haverford College

Robert Daniel Rosenberg — N.Y.
Lynn Brockbank Rowe — Utah
Robert Scott Schuh — N.Y.
(With distinction)
A.B. 1957, Tulane University
Wilbur Lowell Secrist — W.Va.
A.B. 1957, West Virginia University
Robert Morris Senior — Va.
(With distinction)
A.B. 1957, Oberlin College
Leon Gilbert Sheer — Md.
A.B. 1958, The George Washington University
William Hart Sheffield — Calif.
A.B. 1957, Yale University
William Charles Silberman — Va.
A.B. 1958, The George Washington University
Hossein Chaharbashi Sobhani — Iran
B.S. 1957, University of Oklahoma
Peggy Ann Stubbs — Va.
A.B. 1958, The George Washington University
Harry Randolph Tate — Va.
A.B. 1957, University of Virginia
Richard Luman Tenny — N.C.
A.B. 1957, Duke University
William Frederick Thompson — Md.
B.S. 1957, The George Washington University
Donald Julius Tucker — Va.
A.B. 1957, Cornell University
Peter Arthur Tyerman — D.C.
A.B. 1957, University of Oregon
Francis Xavier Urbanski — N.J.
B.S. 1957, Dickinson College
William Vernon Van Fleet — D.C.
(With distinction)
A.B. 1957, A.M. 1959, The George Washington University
Hau Ngoc Vu — D.C.
Arthur Andrew Wallman — N.Y.
B.S. 1957, Queens College
Florent Franklin Westfall, Jr. — Md.
(With distinction)
A.B. 1958, West Virginia University
Daniel Britton White — Mich.
A.B. 1957, Dartmouth College
Warren Arthur Wood, Jr. — Va.
B.S. 1957, Hillsdale College
Gary Warren Zelles — N.J.
A.B. 1957, Rutgers University

STUDENTS REGISTERED IN THE SCHOOL OF MEDICINE

1961–62

First Year

Anderson, Anthon A. III — Utah
Anderson, Gregory D. — Utah
B.S. 1958, University of Utah
Bagley, Grant P. — Utah
B.S. 1961, University of Utah
Balsano, Nicholas A. — N.Y.
B.S. 1960, Iona College
Blau, Anthony D. — D.C.
Brady, John W. — Md.
B.S. 1961, Marietta College
Branch, John W. — Md.
B.S. 1961, University of Maryland
Bright, Robert W. — Va.
A.B. 1961, Ohio Wesleyan University
Brinckerhoff, Gilbert D. — Pa.
B.S. 1959, Lafayette College
M.S. 1961, Massachusetts Institute of Technology
Brings, Marlene E. — Md.
Burton, Francis C., Jr. — Utah
B.S. 1959, University of Utah
Byler, Robert E. — Pa.
Byrd, Edward B. — D.C.
Carlisle, Richard W. — Utah
Carlsen, Andrew B. — N.Y.
B.S. 1960, McGill University, Canada
Chervenak, John P. — Pa.
A.B. 1960, University of Pittsburgh
Cilley, Ronald M. — Maine
A.B. 1961, University of Maine
Clarisse, Peter D. T. — N.Y.
A.B. 1961, Harpur College
Clough, John D. — Md.
B.S. 1961, The George Washington University
Conner, Garrett H. — N.J.
A.B. 1958, Waynesburg College
Daines, Sheridan L. — Utah
Davis, Charles Y. — Va.
A.B. 1961, Johns Hopkins University
Davis, William R. — Calif.
A.B. 1960, University of California
Dewey, George, Jr. — D.C.
A.B. 1960, Duke University
Donahoe, Michael T. — Pa.
Ellison, Gerald L. — W.Va.
B.S. 1960, American University
Ettenson, Stephen C. — N.Y.
Farrell, Donald F. — Calif.
Fidler, William J., Jr. — Va.
A.B. 1961, Washington and Lee University
Filpi, Robert G. — Calif.
B.S. 1961, College of the Pacific
Ford, John L. — Md.
B.S. 1961, University of Maryland
Fortune, Ulla K. M. — Calif.
Fortune, William P. — Calif.
B.S. 1953, Springfield College
Freeland, Alan E. — Ohio
A.B. 1961, Johns Hopkins University
Gemmen, Roger J. — Mich.
Goodridge, Thomas H. — Md.
A.B. 1961, Dartmouth College
Goodstein, Richard K. — N.J.
B.S. 1961, Michigan State University of Agriculture and Applied Science
Gould, Barry K. — D.C.
Haffner, William H. J. — N.J.
A.B. 1961, Wesleyan University
Hardy, Kent M. — Utah
Hazelton, Warren C., Sr. — Maine
Herr, John R. — Pa.
B.S. 1961, Juniata College
Herwick, Paul Q. — Pa.
B.S. in Phar. 1960, University of Pittsburgh
Herzinger, Raymond G. — Idaho
B.S. 1961, Brigham Young University
Hicks, John A. — Calif.
A.B. 1960, Occidental College
Hirschberg, Stanley M. — N.J.
A.B. 1961, Rutgers University
Hodgell, Robert D. — Colo.
A.B., B.S. in Med. Tech. 1959, University of Colorado
Jonas, Cecil R. — British Guiana
B.S. 1960, Howard University
Kaplan, Sheldon J. — N.Y.
Kaplan, Stuart L. — D.C.
A.B. 1961, The George Washington University
Kearney, Gary P. — Calif.
A.B. 1961, Northwestern University
Koo, Andrew H. C. — Hong Kong
Kotzen, Stephen A. — Fla.
B.S. 1961, University of Miami
Koval, Norman S. — N.J.
B.S. 1961, The George Washington University
Laughrun, William A., Jr. — N.C.
A.B. 1955, Wake Forrest College
Lopez-Molina, Carmen M. — Puerto Rico
Lorentz, Mary M. — Md.
A.B. 1961, Trinity College
Mast, William C. — Ariz.
B.S. 1961, University of Arizona
Mathios, Anthony J. — Calif.
Mazzuchi, Daniel S. — Md.
B.S. 1961, College of the Holy Cross
McDougal, Bud H. — Idaho
B.S. 1961, University of Idaho
McElhaney, Robert D. — Wyo.
A.B. 1961, Central Washington College of Education
McPhetres, David W. — Alaska
A.B. 1961, Whittier College
Mering, James H. III — Pa.
Miller, Karl S. — N.J.
B.S. 1961, Mount Saint Mary's College
Millward, David K. — N.Y.
B.S. 1961, Tufts University
Mitchell, John H. — D.C.
A.B. 1961, Ohio Wesleyan University
Moesinger, Robert L. — Utah
Moore, Julian P. — Va.
A.B. 1961, University of Notre Dame
Morris, Gerald G. — Va.
Musick, Roy S. — D.C.
B.S. 1961, The American University
Nixon, Maureen K. — N.Y.
A.B. 1961, Catholic University of America
Odenwald, Robert P. — D.C.
B.S. 1961, College of the Holy Cross
O'Neill, Thomas M. — D.C.
A.B. 1961, Catholic University of America
Oxley, David W. — Iowa
A.B. 1961, Drake University
Paolillo, Richard D. — Conn.
B.S. 1961, College of William and Mary
Pazzaglini, Mario P. — N.Y.
A.B. 1961, Harpur College
Politz, Lawrence — D.C.
Pomerantz, Ruth — N.Y.
A.B. 1961, Brooklyn College
Price, Marian G. — S.C.
A.B. 1961, Eastern Nazarene College
Reynard, John S. — Calif.
A.B. 1961, Stanford University

Rogers, Jerry B. Mo.
B.S. 1960, University of Maryland
Runge, Peter J. N.Y.
B.S. 1961, Villanova University
Scheiner, Monroe I. N.Y.
Secrist, Delbert L., Jr. Ariz.
A.B. 1961, Stanford University
Seymour, John C. N.Y.
A.B. 1961, Brown University
Shively, Harold H., Jr. Conn.
A.B. 1959, Wesleyan University
Steinbrenner, Roger W. Calif.
A.B. 1961, University of California
Stemerman, Michael B. N.Y.
A.B. 1961, University of Rochester
Stiber, Andrew J. N.J.
A.B. 1961, University of Michigan
Stonefeld, Donald F. Ohio
B.S. 1961, Ohio State University
Stones, Carl Idaho
Strautz, Robert L. Ill.
Strother, George W. Pa.
B.S. 1960, University of Pittsburgh
Taylor, Paul C. Ohio
A.B. 1961, Miami University
Tegtmeyer, Charles J. Md.
A.B. 1961, Colgate University
Ugel, Arthur R. D.C.
B.S. 1961, The George Washington University
Vanderford, John W. Idaho
B.S. 1955, Utah State University of Agriculture and Applied Science
A.M. 1959, University of California
Vieweg, Walter V. R., Jr. Va.
B.S. 1957, U.S. Naval Academy
Walen, Harry M. Md.
B.S. 1961, University of Maryland
Warden, William B. W.Va.
Webster, Gerald B. Ariz.
A.B. 1961, Arizona State University
White, Allen C. Calif.
A.B. 1961, Occidental College
Wolf, Robert R. N.J.
A.B. 1961, Rutgers University

SECOND YEAR

Anderson, Danny F. Ga.
B.S. 1960, Furman University
Anderson, Harold F. Calif.
A.B. 1960, Los Angeles State College of Applied Arts and Sciences
Anderson, Todd E. Ill.
A.B. 1960, DePauw University
Anderson, William S. Pa.
B.S. in C.E. 1956, Duke University
Barthelmess, Randall A. Mont.
B.S. 1960, Montana State College
Beachy, Lester Pa.
Beisky, Burton L. Pa.
A.B. 1960, University of Pennsylvania
Bessin, Rolf H. Venezuela
A.B. 1960, Johns Hopkins University
Blakesley, Samuel R. Ariz.
B.S. 1959, University of Arizona
Boas, Edward L. Idaho
B.S. 1960, University of Idaho
Brady, John F. R.I.
A.B. 1960, Providence College
Brazinsky, John H. D.C.
B., 1960, University of Notre Dame
Brink, Edward W. Conn.
A.B. 1960, Trinity College
Buchanan, John G. D.C.
A.B. 1960, Amherst College
Burdge, David C. Va.
B.S. 1958, The George Washington University
Carlson, Dwight L. Calif.
Carvalho, Richard S. R.I.
B.S. 1958, University of Rhode Island
Chan, Philip K. Calif.
Cope, John R. Pa.
B.S. in Phar. 1960, University of Pittsburgh
Cottle, Aaron D. W.Va.
Daines, Jonathan H. Utah
Dew, Donald C. Utah
B.S. 1960, Brigham Young University
Ebert, Charles D. W.Va.
A.B. 1960, West Virginia University
Edwards, Charles B. Utah
B.S. 1960, Brigham Young University
Falor, Stanley L. Ohio
B.S. 1958, Ohio State University
Flanagan, William C. N.J.
A.B. 1960, University of Virginia
Frank, William G. Va.
B.M.E. 1949, University of Louisville
B.D. 1952, Virginia Theological Seminary
Gaither, Robert H. Md.
A.B. 1960, Johns Hopkins University
Gardner, Harvey R. Utah
A.B. 1958, University of California
Gelet, Theodore R. Pa.
B.S. 1959, Pennsylvania State University
Gendelman, Seymour Pa.
B.S. Phar. 1953, Temple University
Hallahan, William F. N.Y.
B.S. 1960, Mount Saint Mary's College, Md.
Hansen, Kenneth R. Idaho
B.S. 1959, Utah State University of Agriculture and Applied Science
Hanssen, Carl A. N.Y.
A.B. 1952, Princeton University
Hinz, William M. Wis.
Holmes, John L. Wash.
House, Homer C. D.C.
B.S. 1959, Washington and Lee University
Hunter, Allan A. D.C.
A.B. 1960, The George Washington University
Hurston, Ronald O. D.C.
A.B. 1960, Yale University
Hushaw, John R. Calif.
A.B. 1960, Occidental College
Itscoitz, Samuel B. D.C.
Jacobson, Cecil Bryant Utah
B.S. 1960, University of Utah
Jones, Thomas L., Jr. Va.
Kass, Martin B. D.C.
Kent, Roy D. Calif.
A.B. 1958, San Jose State College
Kindred, Clifford J. Idaho
A.B. 1955, Brigham Young University
Kniep, William M. Fla.
A.B. 1955, University of Florida
Koslow, Joel L. Mass.
A.B. 1960, Harvard College
Kulaga, Stanley F., Jr. Pa.
B.S. 1960, Temple University
Lima, John B. N.Y.
A.B. 1960, New York University
Lobl, Lawrence T. D.C.
A.B. 1960, The George Washington University
Lose, George W. Ohio
Lyle, Jerry M. Pa.
Madsen, George F. Utah
Maoury, Stanley D. N.Y.
Mayersak, Jerome S. Wis.
A.B. 1960, Johns Hopkins University
Milne, Milton J. Calif.
B.S. 1957, University of California
Morales, Braulio A. Costa Rica
A.B. 1960, Lafayette College
Morris, David L. Calif.
A.B. 1958, University of California
Muir, Bruce B. Calif.
A.B. 1960, University of California
Myers, Norman C. Pa.
A.B. 1960, Washington and Jefferson College
Neviaser, Jules S. D.C.
B.S. 1959, Morris Harvey College

Newell, Peter J. N.M.
A.B. 1960, Occidental College
Nicklas, Richard A. D.C.
A.B. 1958, Cornell University
Nintcheff, Peter Ohio
A.B. 1960, Western Reserve University
Norcross, Frederick C. Md.
A.B. 1960, University of Pennsylvania
Patterson, Robert D. Mo.
A.B. 1960, University of Missouri
Perry, James P. Texas
A.B. 1960, Middlebury College
Pick, Ruthann Ill.
A.B. 1959, Boston University
Pozderac, Rodney V. W.Va.
Regan, Robert M. D.C.
A.B. 1957, Hamilton College
Rice, Russell R. N.J.
A.B. 1960, University of Virginia
Rose, Leslie I. D.C.
A.B. 1960, The George Washington University
Sanchez-Raffucci, Luis A. Puerto Rico
B.S. 1960, Georgetown University
Singer, Karl L. Wash.
B.S. 1959, Washington State University
Stearman, Mandell D. D.C.
Streubert, George E. N.J.
B.S. 1960, Moravian College
Suesserman, Herbert I. N.Y.
B.S. 1960, Long Island University
Takaki, Richard W. Calif.
A.B. 1960, Stanford University
Tarasuk, Albert P. N.Y.
A.B. 1960, The George Washington University
Triggs, Richard A Calif.
B.S. 1959, Long Beach State College
Tyson, Roger I. Idaho
B.S. 1959, University of Idaho
Veverbrants, Egils N.H.
B.S. 1957, University of New Hampshire
Wartofsky, Leonard D.C.
B.S. 1959, The George Washington University
Webster, Thomas M. Va.
A.B. 1960, University of Virginia
White, Gary B. Utah
A.B. 1960, Brigham Young University
White, Gilbert L. Calif.
A.B. 1958, Stanford University
Wierer, Charles R. Md.
B.S. 1960, American University
Yourchek, Walter S., Jr. Calif.
A.B. 1960, Stanford University
Zappia, Robert J. N.Y.
A.B. 1956, University of Rochester
Zeveney, Dennis J. Pa.
B.S. 1960, Kings College
Zimmerman, Jack F. Pa.
B.S. 1960, University of Maryland

THIRD YEAR

Barclay, William A. Pa.
Beaver, Harry C. Pa.
B.S. 1959, Wheaton College
Bradley, Fenwick P. Wash.
Brown, Joel D. Md.
Bruner, Blackwell S. D.C.
Buckingham, Frank M. N.J.
A.B. 1959, University of Nebraska
Bucknell, Thomas E. Calif.
B.S. 1958, San Diego State College
Butler, James S. N.J.
B.S. 1959, Juniata College
Bystrom, John T. Calif.
A.B. 1959, Stanford University
Cohen, Allen B. D.C.
A.B. 1960, The George Washington University
Cohen, Paul G. N.Y.
A.B. 1959, University of Buffalo
Colella, Michael E. N.Y.
A.B. 1959, Hamilton College
Cutshall, Quay B. Wash.
B.S. 1959, Washington State College
Daltorio, Ronald A. Pa.
A.B. 1959, Washington and Jefferson College
Dear, Steven R. Calif.
A.B. 1959, University of California
Denaro, Frank N.Y.
B.S. 1959, College of William and Mary
Denison, Edward K. W.Va.
Dermody, William H. Pa.
B.S. 1959, University of Scranton
Diaz-Granados, Esteban Colombia
B.S. 1959, Fordham University
Dornfeld, Leslie N.J.
A.B. 1959, Rutgers University
A.B. 1959, LaSalle College
Fagan, Walter J. Pa.
Finn, Richard S. N.J.
B.S. 1954, Rutgers University
Fleischner, Gerald M. N.Y.
A.B. 1959, Lafayette College
Foer, Warren H. D.C.
Goodman, David H. D.C.
A.B. 1959, University of Pennsylvania
Greenberg, Peter L. D.C.
A.B. 1959, Johns Hopkins University
Hair, Carolyn J. N.C.
A.B. 1959, Woman's College of the University of North Carolina
Harvey, Jack W. W.Va.
B.S. 1959, The George Washington University
Higgins, Robert M. Ill.
Hobson, Robert W. Va.
B.S. 1959, The George Washington University
Hoffman, Charles J. D.C.
B.S. 1959, The George Washington University
Horowitz, Martin I. N.J.
A.B. 1959, Rutgers University
Hovey, Leslie M. Calif.
A.B. 1959, University of California
Huffman, Stanley R. Ky.
B.S. 1959, University of Kentucky
Hutton, John E. N.J.
A.B. 1953, Wesleyan University
Judd, Howard L. Calif.
Kadell, Barbara M. N.Y.
A.B. 1958, University of Michigan
King, Jerome S. Ohio
A.B. 1959, University of Virginia
Koldinger, Ralph E. Calif.
A.B. 1959, Stanford University
Kruse, John C. Ohio
A.B. 1959, Duke University
Kuhlman, James M. Mich.
A.B. 1959, University of Michigan
Lao, Anita I. Switzerland
Lazarus, Gerald S. N.Y.
A.B. 1959, Colby College
Lewis, Walter J. Ala.
A.B. 1955, Birmingham Southern College
Lyle, Sanford P. N.Y.
A.B. 1959, University of Rochester
McBride, Albert N.M.
Meade, William S. D.C.
B.S. 1957, The George Washington University
Merrill, Keith W. Canada
Michelis, Michael F. N.Y.
A.B. 1959, Columbia University
Miller, Meredith H. N.Y.
A.B. 1959, Johns Hopkins University
Minas, Thomas F. Ariz.
A.B. 1956, University of Arizona
Modlin, Barry D.C.
B.S. 1958, M.S. 1959, The George Washington University

Moede, Austin L. Calif.
A.B. 1959, University of California
Mrkich, Robert Pa.
Murray, Robert O. Utah
A.B. 1959, University of Utah
Peabody, Robert R. Calif.
A.B. 1958, Stanford University
Polidoro, Joseph R. Conn.
A.B. 1959, Rutgers University
Pou, Jose M. Puerto Rico
B.S. 1959, Catholic University of Puerto Rico
Purcell, Lawrence T. N.J.
A.B. 1959, Dartmouth College
Purpura, Anthony G. N.Y.
Rabbitt, Robert W. Md.
A.B. 1959, Catholic University of America
Reed, James W. Md.
Reister, Henry C. D.C.
A.B. 1954, Princeton University
Richardson, Eugene L. Mont.
B.S. 1959, Montana State College
Secks, Richard P. D.C.
A.B. 1959, Bucknell University
Saunders, Barney S. D.C.
A.B. 1959, University of Colorado
Schemmer, Kenneth E. D.C.
B.S. 1959, Purdue University
Sedgewick, Lloyd E. Va.
A.B. 1959, University of Virginia
Shaw, James T. Idaho
B.S. 1959, Brigham Young University
Shepard, Dennis D. Oreg.
B.S. 1959, Oregon State College
Skelly, Thomas D. Pa.
Slichter, Sherrill J. Wash.
A.B. 1959, Washington State College
Smith, Mark A. Va.
A.B. 1959, Virginia Military Institute
Suescum, Rafael A. Panama
Sullivan, Eugene H. N.Y.
A.B. 1957, Williams College
Svoboda, Joseph R. Mont.
Taber, David O. N.Y.
Taggart, Dennis D. Utah
Tomar, Russell H. D.C.
A.B. 1959, The George Washington University
Toomy, William N. N.J.
Trout, Eugene R. Calif.
A.B. 1959, University of California
Ward, George W. D.C.
B.S. 1956, U. S. Military Academy
Ward, Neil O. Ariz.
B.S. 1956, University of Arizona
White, Jerald D. Wyo.
B.S. 1959, Brigham Young University
Wong, Michael J. Calif.
A.B. 1959, Stanford University
Wootton, Devere G. Utah
B.S. 1959, Brigham Young University
Young, Elizabeth Bush Ill.
B.S. 1959, Purdue University

FOURTH YEAR

Allen, George R. Idaho
B.S. 1958, College of Idaho
Anderson, Kathryn A. Md.
Apfelbaum, Herman B. N.Y.
A.B. 1958, Dartmouth College
Asimont, Donna J. D.C.
Asimont, Lee A. Calif.
A.B. 1955, Pacific Union College
Barrett, James E. Mass.
Bedeau, Grover W. Calif.
A.B. 1958, College of the Pacific
Bell, Clyde L. D.C.
Bendler, Benne G. Ind.
Bohan, Michael E. Del.
A.B. 1958, LaSalle College
Brie, Carol R. D.C.
B.S. 1958, University of Richmond
Brunt, Alfred W. Idaho
Buerger, George F. Pa.
B.S. in Phar. 1957, University of Pittsburgh
Buscemi, Michael F. N.J.
B.S. 1957, Georgetown University
Buxton, Terry M. Idaho
B.S. 1959, University of Utah
Carrell, William D. Ariz.
A.B. 1957, Stanford University
Chin, Joyce A. Calif.
A.B. 1958, University of California
Choolitch, Melvin P. Pa.
Clothier, Walter J. Wis.
B.S. 1957, Carroll College
Crandall, Peter L. Calif.
A.B. 1958, San Jose State College
Crown, Ronald F. D.C.
B.S. 1958, American University
Eisenbaum, Sidney L. N.Y.
A.B. 1958, Tulane University
Fogel, Michael R. N.Y.
A.B. 1958, Haverford College
Ganz, Joel N.Y.
Griffiths, Charles W. Calif.
Griffiths, Harold M. Calif.
Guandolo, Vincent L. Md.
A.B. 1953, Kenyon College
Gulak, Hubert M. Pa.
B.S. 1958, Duquesne University
Gwinn, Byron C. D.C
A.B. 1955, Duke University
Hanache, Jeanne A. N.Y.
A.B. 1958, College of New Rochelle
Haney, Leland F. Idaho
B.S. 1958, University of Idaho
Henderson, Robert M. N.M.
Hiebert, Talmage G. D.C.
A.B. 1950, University of Kansas
A.M. 1954, Ph.D. 1956, The George Washington University
Hoexter, Barton Ohio
A.B. 1958, Kenyon College
Hoffman, Michael G. Ariz.
B.S. 1958, University of Arizona
Huffman, Ray T. Ohio
B.S. 1956, Bowling Green State College
Hurt, Arthur C. Calif.
A.B. 1958, Stanford University
Huster, Richard H. Fla.
A.B. 1958, Duke University
Jackson, Mary M. Alaska
A.B. 1950, Montana State University
Janon, Edward A. N.Y.
A.B. 1958, University of Pennsylvania
Jardee, James J. Oreg.
Jones, Lawrence A. Va.
Kachmarick, John A. Pa.
Kauffman, Allan L. N.Y.
B.S. 1958, Wagner Lutheran College
Kundin, Jack E. N.Y.
Lanham, John M. Idaho
B.S. 1952, College of Idaho
Lapiana, Francis G. Calif.
Leake, Francis M. Calif.
A.B. 1958, University of California
Liebler, Fred B. Pa.
B.S. 1958, University of Pittsburgh
Liebler, George A. Pa.
B.S. 1958, University of Pittsburgh
Loop, Floyd D Ind.
B.S. 1958, Purdue University
Loscher, William R. Calif.
B.S. 1958, Washington State College
Lundie, William M. N.Y.
A.B. 1958, New York University
Luthringer, David G. D.C.
A.B. 1958, Princeton University
Marshall, John H. D.C.
B.S. 1958, University of Maryland
Mason, John K. Mont.
B.S. 1954, Rocky Mountain College
Matan, Joseph A. Md.

Mayson, Preston B. S.C.
B.S. 1955, U. S. Military Academy
McBeath, Jo K. Nev
B.S. 1957, Idaho State College
McCreedy, James E. Pa.
B.S. 1958, Westminster College
Meymandi-Nejad, Assadullah Iran
Micale, Joseph N. N.J.
B.S. 1957, Rutgers University
Mihalakis, Isidore Pa.
B.S. 1958, Moravian College
Morrell, Robert H. Idaho
B.S. 1958, University of Oregon
Mullen, Ronald E. Ill.
A.B. 1950, Marion College
B.D. 1956, Northern Baptist Theological Seminary
Nelson, Manfred R. Va.
Nickerson, Richard G. N.Y.
A.B. 1958, New York University
Oberg, Darrell K. N.J.
A.B. 1958, University of Pennsylvania
O'Malley, Donald F. Pa.
Ostler, Richard E. Idaho
B.S. in Phar. 1950, Idaho State College
Patti, Joseph C. N.J.
A.B. 1958, Rutgers University
Peterson, David N. Minn.
B.S. 1958, Brigham Young University
Pfister, Alfred K. W.Va.
A.B. 1958, Washington and Jefferson College
Raphling, David L. Va.
A.B. 1959, The George Washington University
Ricks, David R. Idaho
Roberge, Richard T. Md.
B.S. 1958, University of Idaho
Roberts, Bobbie L. Va.
Rundle, Herman L. Calif.
A.B. 1958, University of California at Los Angeles
Seeman, Kenneth R. N.Y.
A.B. 1958, Franklin and Marshall College
Severino, Lawrence J. N.Y.
A.B. 1958, Cornell University
Sheldon, Frank C. N.J.
A.B. 1958, Rutgers University
Shifrin, Harris D. D.C.
B.S. 1958, The George Washington University
Smith, Robert V. Calif.
Sommerstein, Adam Pa.
Sterling, James A. Md.
A.B. 1958, Williams College
Suescum, Alfredo T. Panama
Swenson, Vernon L. Utah
Weiss, Lowell M. N.J.
B.S. 1957, Rutgers University
Whiting, Edward G. Calif.
A.B. 1958, Stanford University
Whyte, Thomas R. D.C.
B.S. 1958, The George Washington University
Wilner, Elliot C. D.C.
A.B. 1958, Columbia University
Wing, George L. Mass.
A.B. 1958, Harvard University
Wolcott, George J. Nebr.
A.B. 1958, Dartmouth College
Young, Lawrence I. Ohio
A.B. 1958, Stanford University
Young, Stanley B. Ind.
B.S. 1958, Purdue University

SUMMARIES OF REGISTRATION

1961–62

Number of Registrants

Class entering September 1961	104
Class entering September 1960	92
Class entering September 1959	87
Class entering September 1958	96
Total	379

Geographical Distribution of Students

Alabama	1	New York	43
Alaska	2	North Carolina	2
Arizona	8	Ohio	11
California	46	Oregon	2
Connecticut	4	Pennsylvania	45
Delaware	1	Rhode Island	2
District of Columbia	50	South Carolina	1
Florida	3	Texas	1
Georgia	2	Utah	19
Idaho	17	Virginia	17
Illinois	7	Washington	5
Indiana	3	West Virginia	8
Iowa	1	Wisconsin	3
Kentucky	1	Wyoming	2
Maryland	21	Puerto Rico	3
Massachusetts	3	British Guiana	1
Michigan	2	Canada	1
Minnesota	1	Colombia	1
Missouri	2	Costa Rica	1
Montana	4	Hong Kong	1
Nebraska	1	Iran	1
Nevada	1	Panama	2
New Hampshire	1	Switzerland	1
New Jersey	25	Venezuela	1
New Mexico	3		

Graduates of Colleges Registered in the School of Medicine

American University	4	Central Washington College of Education	1
Amherst College	1	Colby College	1
Arizona State University	1	Colgate University	1
Arizona, University of	5	Colorado, University of	2
Birmingham Southern College	1	Columbia University	2
Boston University	1	Cornell University	2
Bowling Green State University	1	Dartmouth College	4
Brigham Young University	9	De Pauw University	1
Brooklyn College	1	Drake University	1
Brown University	1	Duke University	5
Bucknell University	1	Duquesne University	1
Buffalo, University of	1	Eastern Nazarene College	1
California, University of	12	Florida, University of	1
California, University of, at Los Angeles	1	Fordham University	1
Carroll College	1	Franklin and Marshall College	1
Catholic University of America	4	Furman University	1

George Washington University, The	21
Georgetown University	2
Hamilton College	2
Harpur College	2
Harvard University	2
Haverford College	1
Holy Cross, College of the	1
Howard University	1
Idaho, College of	2
Idaho State College	2
Idaho, University of	5
Iona College	1
Johns Hopkins University	7
Juniata College	2
Kansas, University of	1
Kentucky, University of	1
Kenyon College	2
King's College	1
Lafayette College	3
LaSalle College	2
Long Beach State College	2
Long Island University	1
Los Angeles State College of Applied Arts and Sciences	1
Louisville, University of	1
Maine, University of	1
Marietta College	1
Marion College	1
Maryland, University of	6
Massachusetts Institute of Technology	1
McGill University, Canada	1
Miami University	1
Miami, University of	1
Michigan State University of Agriculture and Applied Science	1
Michigan, University of	3
Middlebury College	1
Missouri, University of	1
Montana State College	2
Montana State University	1
Moravian College	2
Morris Harvey College	1
Mount St. Mary's College	2
Nebraska, University of	1
New Hampshire, University of	1
New Rochelle, College of	1
New York University	3
Northern Baptist Theological Seminary	1
Northwestern University	1
Notre Dame, University of	2
Occidental College	4
Ohio State University	2
Ohio Wesleyan University	2
Oregon, State College of	1
Oregon, University of	1
Pacific, College of the	2
Pacific Union College	1
Pennsylvania State University	1
Pennsylvania, University of	4
Pittsburgh, University of	8
Princeton University	3
Providence College	1
Purdue University	4
Rhode Island, University of	1
Richmond, University of	1
Rochester, University of	3
Rocky Mountain College	1
Rutgers University	10
San Diego State College	1
San Jose State College	2
Scranton, University of	1
Springfield College	1
Stanford University	12
Temple University	3
Trinity College	1
Tufts University	1
Tulane University	1
United States Military Academy	2
United States Naval Academy	1
Utah State University of Agriculture and Applied Science	2
Utah, University of	6
Villanova University	1
Virginia Military Institute	1
Virginia Theological Seminary	1
Virginia, University of	5
Wake Forrest College	1
Wagner Lutheran College	1
Washington and Jefferson College	3
Washington and Lee University	2
Washington State College	3
Washington State University	1
Waynesburg College	1
Wesleyan University	3
West Virginia University	1
Western Reserve University	1
Westminster College	1
Wheaton College	1
Whittier College	1
William and Mary, College of	2
Williams College	2
Woman's College of the University of North Carolina	1
Yale University	1
Number of College Graduates	275
Number of Colleges Represented	107

INDEX

A

Academic status, 3
Administration, Officers of, 2
Administrative Assistants:
  School of Medicine, 19
  University Hospital, 36–38
Admission, 27–28
  Application for, 27
  Selection procedure, 28
Advanced standing, 28
Affiliated hospitals, 26–27
Anatomy, courses in, 39–40
Anesthesiology, courses in, 40–41
Arts and Medicine, combined curriculum, 32
Assistants in Research and Instruction, 17–19
Attendance, 31

B

Bachelor of Arts, degree of, 32
Biochemistry, courses in, 41–42

C

Calendar of the School, vi
Cancer Clinic, 26, 37
Clinical facilities, 25–27
Colleges from which students hold degrees, 67–68
Committees:
  of the Faculty, 20–21
  of the Hospital Medical Staff, 35–36
Cost of text books and equipment, 29
Courses of Instruction, 39–57
  Numbers and symbols used in connection with, 39
Curriculum, 23–24

D

Degrees conferred in 1961, 60–61
Departments of Instruction, 39–57
Dermatology, courses in, 42
Doctor of Medicine, degree of, 32

E

Emeritus Professors, 4
Entrance requirements, 27
Equipment and facilities, 25
Examinations, 31

F

Faculty, 1961–62, 20
Fees and financial regulations, 28–29
Fellowship programs, 37–38

G

Geographical distribution of students, 67
Government museums, 25
Grades, 31
Graduation:
  Application for, 31
  Presence at, 31
Gynecology, courses in, 47

H

Health Administration, 32
History of the School, 21
History of the University, 3
Honor societies, 34
Honors, 32
Hospital, 25, 26, 34–38
  Medical Staff, 35–36

I

Intern programs, 37

L

Laboratories, 25
Library, 25, 37
Living accommodations, 33
Loan funds, 30–31
Location of the University, 3

M

Medical Admission Test, 28
Medical School Building, 25
Medical Technology Course, 38
Medicine, courses in, 42–44
Microbiology, courses in, 44–46

N

Neurology and Neurological Surgery, courses in, 46–47

O

Objectives of the School of Medicine, 22
Obstetrics, courses in, 47
Ophthalmology, courses in, 48
Orientation program, 22
Otolaryngology, courses in, 48
Outpatient Department, 37

P

Pathology, courses in, 48–50
Pediatrics, courses in, 50–51
Pharmacology, courses in, 51–52
Physical examinations, 33
Physical Medicine, courses in, 52
Physiology, courses in, 52–53
Plan of instruction, 22–23
Prizes, 30
Psychiatry, courses in, 54–55

R

Radiology, courses in, 55
Recreation, 34
Registration, 28
  Summaries of, 67–68

Regulations, 31–34
Rehabilitation, courses in, 52
Research, assistants, in, 17–19
Research building, 25
Resident programs, 37
Right to change rules, 34
Right to dismiss students, 31

S

Scholarships, 29–30
Staff of Instruction, 1961–62, 4–17
Standing of the School, 3
Student equipment, cost of, 29
Students registered, 1961–62, 62–66
Surgery, courses in, 55–56
Syphilology, courses in, 42

T

Technical assistants, 19
Textbooks, cost of, 29
Trustees, Board of, 1

U

University:
  Academic status, 3
  Colleges, schools, divisions, 3
  History, 3
  Location, 3
Urology, courses in, 56–57

AFFILIATED HOSPITALS



Mount Alto Veterans Administration Hospital



Admitting Unit, St. Elizabeths Hospital



Children's Hospital



D. C. General Hospital



Fairfax Hospital

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE LAW SCHOOL, 1865

THE SCHOOL OF ENGINEERING, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF SPECIAL STUDENTS, 1944

THE DIVISION OF AIR SCIENCE, 1951

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

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PREFATORY NOTE

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CONTENTS

DOCTOR OF PHILOSOPHY

Page

AARON GOLDBERG
The Genus Melochia in America (February 22, 1962) 3

MILTON GORDON
Studies on the Relationship of Delayed Hypersensitivity to Immunity in Tularemia (February 22, 1962) 7

RONALD GROVER KUNTZMAN
Studies on Catecholamines in Nervous Tissue (February 22, 1962) 10

JAMES BRYAN PIRSCH
Characteristics of Variola Virus in Tissue Culture (February 22, 1962) 13

HOWARD RICHARD ROBERTS
Some Results in Life Testing Based on Hypercensored Samples from an Exponential Distribution (February 22, 1962) 15

ROBERT SANFORD ROZMAN
Studies on the Reaction of Bis-β-Chloroethyl Sulfide with Purines, Pyrimidines, and Polynucleotides (February 22, 1962) 111

ARCHIBALD JOHNSON SAMPSON
Forging Democracy in Malaya (February 22, 1962) 19

JAMES BLAKE THOMAS
Abnormal Development of the Early Chick Embryo Due to Influenza A Virus: An Histochemical Analysis (February 22, 1962) 23

GEORGE HENRY WIRTZ
Some Biochemical Studies of the First Component of Complement (February 22, 1962) 26

BERTIE HAROLD REGINALD WOOLF
Facilitation and Interference in Concept Formation (February 22, 1962) 29

CYRUS ROBBINS CREVELING
Studies on Dopamine-β-Oxidase (June 6, 1962) 31

SIDNEY ALBERT FINE
Functional Job Analysis as a Method of Indirect Validation: A Study in Synthetic Validity (June 6, 1962) 33

WALTER ANDREW GENTNER
The Influence of Ethyl N,N-di-n-Propylthiolcarbamate (EPTC) on Wax Formation in Cabbage (June 6, 1962) 38

JANET WILDMAN JOHNSON
An Investigation of Relationships between College and Senior Student Characteristics and Performance on the Aptitude and Area Tests of the Graduate Record Examination at The George Washington University (June 6, 1962) 39

JEROME KERN
Studies of Hemagglutination by Enteroviruses (June 6, 1962) 45

Page

WALTER MCKAY LOVENBERG
Studies on the Enzymatic Decarboxylation of Aromatic Amino Acids (June 6, 1962) 47

THOMAS ELIJAH SMITH
Investigations on the Mechanism of Action and Inhibition of Monoamine Oxidase (June 6, 1962) 49

DOCTOR OF JURIDICAL SCIENCE

EDWARD GERARD HUDON
The Evolution of First Amendment Doctrines in the Supreme Court: An Historical Study of Cases on Freedom of Expression (February 22, 1962) 55

ROBERT B. ELLERT
NATO "Fair Trial" Safeguards: Precursor to an International Bill of Procedural Rights (June 6, 1962) 63

CECIL THOMAS LAKES
Extraordinary Contractual Authority in Government Defense Procurement (June 6, 1962) 69

SHERWIN CARL PELTIN
Manufacturers' Excise Taxes (June 6, 1962) 76

DOCTOR OF SCIENCE

CLIFFORD DURAS FERRIS
On Some Phenomena of Interaction of Electromagnetic Fields with Moving Electrically Conducting Fluids with Application to Biological Flowmetry: A Critical Study (February 22, 1962) 87

DOCTOR OF EDUCATION

ROBERT EDWARD BAKER
Changing Expectations for the American Elementary School Teacher: Selected Teaching Ability Requirements as Revealed by an Analysis of State Courses of Study, 1930–1961 (February 22, 1962) 95

GEORGE SAMUEL FOSTER
An Evaluation of Supervision of Volunteer Leaders in Tennessee 4-H Club Work (February 22, 1962) 101

MARCELLA SIEGEL BERNSTEIN
The Parent-Teacher Conference: An Analysis of Selected Conference Problems (June 6, 1962) 106

JOHN MORRISON KING
Organization and Functions of the Central Staff of the Office of the Superintendent in Suburban School Districts with Populations of 10,000 to 100,000 (June 6, 1962) 112

LUTHER FRANKLIN SIES
The Number, Intensity, and Persistence of Professional Problems of Beginning Elementary School Teachers as Related to Patterns of Teacher Preparation (June 6, 1962) 115

SUMMARIES OF DISSERTATIONS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

THE GENUS MELOCHIA IN AMERICA

by AARON GOLDBERG*

Melochia is a genus of the family Sterculiaceae, tribe Hermannieae, subtribe Melochinae. The genus was validated by Linnaeus in the first edition of his *Species Plantarum*, and the fifth edition of his *Genera Plantarum* established *Melochia corchorifolia* L. as the type.

The genus occurs in tropical and subtropical regions between approximately 33° N. and 33° S. latitudes. In America it extends from the southern United States to northern Argentina and Uruguay. It occurs also in the West Indies. The greatest number of species is found in northern South America. Typically they are savanna plants, but species also occur in thickets, fields, or woods, sometimes on hillsides, and usually in the sun. Many species live in dry habitats, several in wet areas. Some species grow in soil derived from igneous rocks, others in soil derived from limestone, or serpentine, and some grow among rocks. They are found at elevations of 0-3,150 meters.

The genus has no outstanding economic importance. Some species have fine silky fibers which are used locally. Some occur in pastures. A few are weeds. Some are used locally as a demulcent in enteritis. The flowers are a source of food for honey-bees. One species is planted as a shade tree.

None of the earlier treatments of the genus in America accounts for more than half of the taxa known at present, and many contain erroneous nomenclature, misinterpretations of taxa, and other inaccuracies. Diagnostic characters are frequently not given and descriptions are very incomplete. Approximately 300 names and combinations have been used to describe the types of *Melochia* in America.

I have examined about 2,500 specimens from 20 American and European herbaria. The specimens are cited under the pertinent species and the distribution of the species, by countries, is given in an appendix. From them I have prepared a map of the geographical distribution of the genus in America. I have made more than 30,000 observations, about half of them measurements under the dissecting microscope, of characters in the genus. Thus, I have supplied much of the information lacking in the earlier descriptions. As a result of my studies, I consider 55 taxa adequate to describe the American types in the genus as now known. The genus is represented in America by 42 species, several of which contain varieties. Two species and two varieties are described as new. Several new combinations and other corrections in nomenclature have been made. Keys to the sections, species, and varieties have been prepared.

* A.B. 1939, Brooklyn College; M.S. 1954, DePaul University; Ph.D. conferred February 22, 1962. Director of research: Lyman Bradford Smith, *Professorial Lecturer on Plant Taxonomy; Curator, Division of Phanerogams, Department of Botany, Smithsonian Institution; Research Consultant in Taxonomy, The Graduate Council.*

The American species of the genus had previously been grouped in three sections. I have emended the descriptions of the sections and changed their nomenclature, where necessary, to conform with the present International Code of Botanical Nomenclature. I have added a fourth section, *Physodium*.

Species of *Melochia* in America are primarily shrubs or subshrubs, sometimes herbs or small trees, 0.08-10.0 meters high. They are mostly perennial and often have a woody taproot. They are subglabrous to densely tomentose, sericeous, velutinous or lanate and canescent, cinereous, or brownish. The hairs are stellate and few- to many-rayed, forked, simple, or glandular, the last consisting of a column of cells with the distal one enlarged. They are 1.0-4.0 mm long. The young stems sometimes have a large pith or are hollow. The internodes are 0.2-11.0 cm long.

The leaves are simple and alternate. The stipules are 1.5-10.3 mm long and 0.2-5.0 mm wide, deltoid-acuminate or -acute, lanceolate, or linear. The petiole is 0.07-8.0 cm long. The lamina is 0.6-22 cm long and 0.2-11.5 cm wide, ovate, lanceolate, linear, oblong-ovate, or suborbicular. In a few species one side is larger than the other. The base is usually rounded to cordate, sometimes truncate, cuneate, or oblique. The apex is usually acute to acuminate, sometimes rounded. The margin is usually crenate-serrate, the serrations being 0.3-12.0 mm wide and 0.2-3.6 mm high. There are 4-15 pairs of primary veins, usually two being basal. The veins are usually impressed above and prominent beneath.

The inflorescences are axillary, terminal, leaf-opposed, or 90° from the leaf. They are cymose and umbellate, subcapitate, paniculate, spicate, or corymbiform and 0.6-34 cm long. The peduncle is 0-8.5 cm long. Sometimes it has a primary branch 0.2-3.5 cm long, rarely a secondary one up to 1.5 cm long, and a tertiary one up to 0.7 cm long. The pedicel is 0-19 mm long. The bracts are 0.5-12 mm long and 0.1-4.8 mm wide. Sometimes 2-3 immediately subtend each flower whereas in some species they are at the base of the pedicels. Sometimes 2-3 are united part way. They are similar in shape to the stipules.

The flowers are polypetalous, actinomorphic, perfect, hypogynous, and usually dimorphic. There are five antepetalous stamens. The filaments are partially or completely attached to one another. Staminodes are usually absent. Sometimes there are five, 0.1-1.2 mm long, alternate with the fertile stamens. They are usually dentiform, sometimes elongated. The anthers are dithecous, extrorse, attached to the filaments at the middle, 0.4-2.6 mm long, 0.3-1.2 mm wide, oblong, and emarginate at both ends, sometimes nearly to the middle from the apex. The pollen is smooth, usually globular and 34-49 μ in diameter, sometimes subprolate and 51 μ long and 44 μ wide. There are five, rarely six to eight, antepetalous carpels. The styles are filiform, and sometimes slightly clavate at the apex. The placentation is axile, the ovules being attached ¼-⅓ the way up from the base of the carpel. There are 2 ovules per carpel, superposed and close to one another. They are anatropous, the funicle ascending on the adaxial surface of the ovule. The calyx is quinquefid, valvate in aestivation, persistent, usually green, sometimes rose, rose-purple, or yellow. Sometimes it is membranous. It is 1.4-15.0 mm long and 2.1-8.5 mm wide, with teeth 0.4-7.8 mm long and 0.2-5.5 mm wide. Sometimes it is accrescent, becoming up to 36 mm long and 19 mm wide, with teeth up to 12 mm long and 10 mm wide. The teeth are usually deltoid-acute or -acuminate, sometimes nearly linear.

The sinus is usually acute, sometimes rounded to truncate. Sometimes there is glandular tissue between the calyx and the corolla and between the bases of the petals. There are 5 petals, which are flat, veined, convolute in aestivation, and often marcescent. They are purple, pink, purple distally and yellow or orange proximally, yellow, orange, white, blue, red, or violet. They are 2.7-17.4 mm long and 0.8-9.5 mm wide, usually obovate or oblanceolate, sometimes obdeltoid or obovate-oblong. The base is cuneate or spatulate, free from the staminal tube or attached to it for 0.3-5.0 mm. The claw is 0-6.5 mm long. Sometimes there are a few hairs on the petals or at the base of the staminal tube.

In the longistylous form of the flower, the stamens are 2.4-9.0 mm long. The filaments are united up to the anthers or free for 0.4-3.0 mm. The pistil is 2.6-12 mm long. The styles are free for 1.2-6.7 mm. They are free to the ovary or united for 0.3-4.0 mm. They are papillose at the apex for 0.5-2.5 mm. In the brevistylous form, the stamens are 2.8-11.3 mm long. The filaments are free for 0.5-7.5 mm. The pistil is 2.3-8.0 mm long. The styles are free for 0.8-5.3 mm. They are free to the ovary or united for 0.2-3.0 mm. They are papillose for 0.3-1.0 mm at the apex. The flowers of several species in the section *Melochia* are not dimorphic. The stamens and pistils are 1.7-3.2 mm long. The filaments are free for 0-1.2 mm. The styles are free for 0.6-1.2 mm. They are free to the ovary or united for 0.1-0.3 mm.

The fruit is a schizocarp or capsule 2.4-12 mm long and 2.9-22 mm wide. It is subglobular and pentagonal or pyramidal and pentapterous. The sulci between the carpels are shallow to deep, extending 1/5-1/2 the way to the center of the fruit. The stipe is 0-6.7 mm long. Dehiscence is (1) septicidal into cocci with a narrow ventral slit, (2) loculicidal all along the ventral suture, the cells gaping ventrally, and 1/5-1/2 the way along the dorsal suture, and sometimes eventually septicidal, or (3) first loculicidal all along the dorsal suture and then often septicidal. The seeds are 1.4-3.9 mm long and 0.9-2.5 mm wide. They are usually trigonal, the dorsal surface being rounded and the sides flat. Rarely the chalazal end of the testa is loosened, membranous, and almost wing-like for 0.1-0.3 mm. The seeds are brown to black. There are 1-2 per cell. The embryo is straight, 1.5-2.7 mm long and embedded in fleshy endosperm. The cotyledons are 0.7-1.7 mm in diameter, flattened, suborbicular, subcordate at the base, and rounded at the apex. The radicle is inferior, terete, 0.7-1.1 mm long and 0.25-0.5 mm. wide. The plumule is not evident at this stage. Venkata Rao studied the early stages in the development of the embryo of *M. corchorifolia*.

Cristóbal studied the chromosomes of two species of *Melochia*. In both the diploid number was 18.

The flowering and fruiting periods are usually extended, continuing sometimes throughout the year. The flowers are sometimes matutinal, fragrant, and visited by honey-bees.

Evolution and relationships in the genus are discussed. The genus probably originated in America at a time when warm, moist conditions prevailed. The great majority of species occur in America and the characters of some species found there are as primitive as those of the species occurring elsewhere. Species of *Melochia* are mostly perennial subshrubs or shrubs, but toward the extremes of the

range of the genus they have become herbs, and a few are annuals, which avoid the rigors of a cold season. Other species have become adapted to withstand moisture stress by means of a dense indument and increased thickness of the leaves. Stellate hairs occur most commonly in the sections *Pyramis* and *Physodium*, whereas simple ones are most common in the sections *Melochia* and *Mougeotia*. Moisture is also conserved by those species with small leaves and short internodes in the vegetative stems and inflorescences. In some species of the section *Melochia* the internodes between the bracts have become reduced so that the latter immediately subtend the flowers, and in some species the bracts are enlarged, closely invest the flowers, and take over the protective function of the calyx. The stipe is well developed in the section *Physodium* but it is much reduced or absent in species of the other sections. The general trend is from loose to compact types of inflorescences. In the latter the flowers have become reduced in size. Reduction has occurred particularly in the calyx and it is most pronounced in the section *Melochia*. Reduction has also occurred in the essential organs. Staminodes, the vestiges of one of the cycles of stamens, are elongated and most evident in some species of the section *Physodium*. In several species, particularly those of the other sections, they are merely dentiform or entirely absent. The fertile stamens show a trend toward the loss of connective between the anther sacs, so that the species advanced in this respect have deeply emarginate anthers and divergent anther sacs. This is especially the case in the sections *Mougeotia* and *Melochia*. The number of carpels is commonly five, but species primitive in this regard frequently have six to eight. There are two ovules in each carpel, but in many species one aborts and but one seed develops.

The organs of the flower are homologous with leaves and, like the latter, in the primitive condition are separate. In some species of the section *Melochia* two or three of the bracts may be partially united. In the section *Pyramis* the petals are attached to the staminal tube at the base. In some species of the sections *Mougeotia* and *Melochia* the petals are free of the staminal tube; in others they are attached to it at the base. In the sections *Melochia* and *Mougeotia* the filaments in the longistylous form of the flower are usually united up to the anthers. They are united to a lesser extent in the other sections. In the section *Physodium* the styles are free to the ovary, in the section *Mougeotia* they are usually free to the ovary, and in the section *Melochia*, often so, whereas in the section *Pyramis* they are united at the base. The cells of the fruit vary in the extent to which they are united in the different species. In species of the section *Melochia* they are usually united for a greater distance along their sides than they are in species of the other sections.

The fruits of some species of the section *Mougeotia* dehisce in the most primitive manner, along the ventral suture, the site along which union occurred by infolding of the carpel phyllomes. In some species of this section it is also septicidal, along the union between carpels. In the other sections dehiscence is first loculicidal along the dorsal suture, the most advanced means of dehiscence in the genus, and in a few species of the section *Melochia* it is no longer also septicidal.

Taking into account the evolutionary changes discussed above, geographical distribution, and the genetic principle that similarity of structure among species of the same genus is primarily indicative of genetic relationship, I have arranged the American species of *Melochia* according to my understanding of their relationships.

STUDIES ON THE RELATIONSHIP OF DELAYED HYPERSENSITIVITY TO IMMUNITY IN TULAREMIA

by MILTON GORDON*

The relationship between delayed hypersensitivity and resistance to infectious organisms has never been clearly defined. It is held by some that the inflammation consequent to the allergic reaction is generally helpful in impeding the spread of microorganisms through the body. Others view the inflammatory reaction as a serious liability because of the destruction of tissue that occurs. If the hypersensitive state is regarded as an asset, does a correlation exist between delayed hypersensitivity and immunity? Can one infer from the existence of a delayed hypersensitive state an immune state also? This dissertation presents evidence that in tularemic infection in guinea pigs no positive correlation exists between delayed hypersensitivity and immunity.

Tularemia is primarily a disease of rodents, rabbits, hares, and birds. It is transmitted in nature by flies, fleas, lice, and ticks. Man is an accidental host. Tularemia in man is an acute, moderately severe febrile disease with a tendency to pneumonic complications. Although an attack of tularemia usually confers a lasting immunity, reinfections have been reported. Nonviable vaccines have been available for years, but are of limited value. The disease evokes a hypersensitive state; an intradermal test has served as a diagnostic aid for many years.

Hypersensitivity reactions are broadly categorized into immediate and delayed types. Delayed hypersensitivity has been defined as an increased, unfavorable tissue reactivity of an individual toward a specific substance, usually resulting from prior experience with the same or chemically related substance. It is the latter type, the tuberculin type or so-called allergy of infection, that is of concern in this study.

The approach taken to resolve the relationship between the phenomena of delayed hypersensitivity and immunity was to induce these manifestations in guinea pigs by various procedures and under special conditions to determine whether a parallelism of the responses existed.

Guinea pigs were selected as the animal of choice because of their ability to develop delayed hypersensitivity similar to that in man. Two attenuated strains of *Pasteurella tularensis*, designated Jap and LVS, were used to induce infection and acquired resistance. A highly virulent strain, Schu S4, was used for challenge.

The material used for skin testing was a saline suspension of heat-killed Schu

* A.B. 1950, University of California at Los Angeles; M.S. 1955, The George Washington University; Ph.D. conferred February 22, 1962. Director of research: George Green Wright, *Chief, Immunology Branch, Fort Detrick; Research Consultant in Immunology, The Graduate Council.* Co-director of research: Angus MacIvor Grillin, *Professor of Microbiology.*

S4 strain organisms, injected intradermally in 0.1 ml amounts into the flank of the animal. Measurement of the dermal response was made 24 hours after testing. The greatest right angle diameters were measured with calipers, and the area of reaction was estimated as the product of the two dimensions.

Immunity was calculated as the difference between the average day of death of experimental and control groups of animals. The observation period was 21 days.

Immunization of guinea pigs with viable attenuated organisms induced a marked degree of delayed hypersensitivity and an appreciable level of immunity in one month. Over a three-month period the courses of both responses appeared to be parallel; there was no indication that the phenomena were separable.

The effect of desensitization upon immunity was investigated. Hypersensitive, immune guinea pigs were desensitized with daily injections of heat-killed Schu S4 strain organisms for 21 days. The delayed hypersensitive response was reduced markedly, but the immune response remained unchanged. Withdrawal of the desensitizing injections resulted in a return of dermal reactivity. The experiment demonstrated that guinea pigs can possess appreciable immunity in the absence of any substantial delayed hypersensitive response.

Injection of animals with heat-killed organisms in incomplete Freund adjuvant elicited a moderate degree of delayed hypersensitivity and only a minimal level of resistance in approximately three weeks.

Induction of delayed hypersensitivity was attempted with immune complex—specific antibody adsorbed to killed Schu S4 strain organisms. Injection of this complex, emulsified in incomplete Freund adjuvant, evoked a moderate degree of delayed hypersensitivity and a minimal level of resistance in six days. This experiment and the one just previously described showed that the parallelism of responses noted after immunization with viable organisms did not exist after immunization with nonviable preparations.

Two other approaches were taken to determine if hypersensitivity could be demonstrated in essentially nonimmune animals. The first of these approaches was based on the phenomenon of immunologic unresponsiveness. Guinea pigs 6 to 10 hours old were exposed to heat-killed organisms and, as they approached maturity, were subsequently immunized with viable attenuated *Past. tularensis*. Delayed hypersensitivity, comparable to that of control animals not exposed to antigen at birth, was demonstrated one month after immunization. Although the animals exhibited an immune response, it was significantly lower than that of control animals. Only a partial suppression of immunity was achieved in adult guinea pigs exposed at birth to nonviable organisms.

The second approach was an attempt to demonstrate hypersensitivity in animals showing a suppressed immune response as a result of X-irradiation. Groups of guinea pigs were irradiated with graded dosages of X-rays from zero to 140 r (the $LD_{50/30}$ dose is approximately 250 r with the machine used), and infected with viable attenuated organisms 48 hours later. There appeared to be no distinct effect of irradiation upon the delayed response nor upon acquired resistance approximately one month after infection. Irradiation with dosages up to 220 r resulted in a high

proportion of deaths within two weeks as a result of the combined effects of irradiation and superimposed infectious processes.

The results of this research have shown that immunization with viable attenuated organisms evoked both delayed hypersensitivity and immunity. Although a parallelism in the responses during the first three months of infection seemed to indicate that an apparent positive relationship existed between the phenomena, successful desensitization of these animals demonstrated that immunity can exist in the absence of any appreciable level of delayed hypersensitivity.

The interpretation that delayed hypersensitivity and immunity are independent phenomena was strengthened by the fact that immunization with nonviable preparations resulted in elicitation of moderate levels of hypersensitivity with minimal levels of acquired resistance.

The partial success obtained in the experiment based on immunologic unresponsiveness does not detract from the conclusion that the phenomena are independent. The results of this experiment are interpreted to indicate that the immunological mechanisms of the guinea pig mature rapidly after birth. The guinea pig may have been an unfortunate choice of animal for this particular phase of the work.

Delayed hypersensitivity and immunity of X-irradiated animals one month after infection appeared to be unaffected by the irradiation. These responses were not determined at other intervals. It is possible that the leukopenia and tissue cell destruction caused by irradiation provide an environment for increased vaccine potential.

Whether delayed hypersensitivity and immunity are consequences of stimulation by one antigen or by two different antigens is not known. The antigen associated with protective immunity has not been defined or isolated.

If one antigen is concerned in the two responses we can postulate a single mechanism in which the immunological manifestations are the results of various degrees of antigenic stimulation. An initial, moderate stimulation (or alteration) of a host cell induces delayed hypersensitivity. A further, more intense stimulation induces cellular resistance.

If two different antigens are responsible for each of the manifestations we can imagine that viable organisms contain both an immunizing antigen and a sensitizing antigen. Nonviable preparations may have lost the immunizing antigen during manipulation. The lack of purified antigens with protective activity points up the limitations of this study, and prevents firmer conclusions at this time.

In extrapolating the results of this research to man, we can infer that similar mechanisms are operative here. The existence of a delayed hypersensitive state in man is usually interpreted to indicate past or current exposure to the infectious organism. But just as under special conditions a lack of correlation between delayed hypersensitivity and immunity was demonstrated in guinea pigs, one should consider that a similar lack of correlation may exist in man.

STUDIES ON CATECHOLAMINES IN NERVOUS TISSUE

by RONALD GROVER KUNTZMAN*

The work presented here has dealt with some aspects of the biosynthesis, storage, and metabolism of norepinephrine, dopamine, and serotonin. Since recent evidence suggests that these amines have a regulatory role in the central nervous system, a study designed to relate the biochemistry of these amines in the central nervous system to their function was undertaken.

To make this approach possible, methods were developed to measure in extremely small amounts of tissue the levels of serotonin and norepinephrine, as well as some of the enzymes involved in their synthesis and metabolism.

A new method, ten times more sensitive than the usual manometric procedures, was developed to assay *in vitro* DOPA decarboxylase activity by measuring the formation of dopamine in as little as 20 mg of nerve tissue. An additional advantage of this new method is its specificity, for the rate of decarboxylation of DOPA can be measured in the presence of other substrates of this enzyme.

The sensitivity of the method for the determination of 5-hydroxytryptophan decarboxylase activity has been increased to make possible the assay of this enzyme in 20 mg of tissue. Modifications of the fluorometric methods for the estimation of norepinephrine and serotonin have been presented which make possible the determination of these amines in amounts of tissue containing as little as 0.04 micrograms of norepinephrine or 0.200 micrograms of serotonin. These modifications increased by about ten times the sensitivity of previously published fluorometric methods. Thus, the method for norepinephrine analysis is now comparable to the usual bioassay procedure, which is less precise and specific.

A new method has been presented which measures the relative inhibition of monoamine oxidase *in vivo*. This method is of importance in view of the finding that the determination of monoamine oxidase activity *in vitro* may give results which cannot be interpreted. For example, as presented in this dissertation, a 95 per cent inhibition of monoamine oxidase activity measured *in vitro* was not sufficient to impair serotonin metabolism *in vivo*.

With the use of these methods the distribution in brain of norepinephrine, serotonin, DOPA decarboxylase, and 5-hydroxytryptophan decarboxylase has been studied.

The activity of DOPA decarboxylase roughly parallels the level of norepinephrine in different parts of the brain except in the caudate nucleus. This structure contains little norepinephrine, but has an extremely high DOPA decarboxylase activ-

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* B.S. 1955, Brooklyn College; M.S. 1957, The George Washington University; Ph.D. conferred February 22, 1962. Director of research: Bernard Beryl Brodie, *Chief, Laboratory of Chemical Pharmacology, National Heart Institute; Research Consultant in Biochemical Detoxication, The Graduate Council.* Co-director of research: Joseph Hyram Roe, *Professor Emeritus of Biochemistry in Residence.*

ity and a high level of dopamine about 5.0 γ/g. Although there is a positive relationship between the levels of norepinephrine and DOPA decarboxylase activity, a better relationship might exist between the levels of norepinephrine and the hydroxylase which converts dopamine to norepinephrine, since, as suggested in this dissertation, this enzyme is probably the rate-limiting step in the synthesis of norepinephrine.

In all the brain areas studied a constant ratio between the activities of DOPA and 5-hydroxytrytophan decarboxylase was found suggesting that the same enzyme is responsible for the decarboxylation of both amino acids. The implications of this finding are important when studying the biochemical and physiological effects of injected precursors; for example, serotonin will be formed from 5-hydroxytryptophan not only in places where it is normally synthesized and released but also in neurons which normally contain catecholamines. The lack of specificity of the decarboxylase makes it difficult to use injections of biological precursors to study the action of these amines normally formed at their biosynthetic sites.

A detailed mapping of DOPA-5-hydroxytryptophan decarboxylase activity has shown that this enzyme is concentrated in the brainstem reticular formation, hypothalamus, basal and intralaminar portions of the thalamus, and several structures of the limbic system. In other words, the enzyme is localized in those areas which coordinate behavioral, autonomic, and somatic activity. The level of the decarboxylase was low in other parts of the brain including white matter, cerebellum, and cortex. Of particular significance was the finding that the nuclei of specific sensory pathways contain little enzyme activity even when these areas are located near structures that have high enzyme content.

A comparison of serotonin and norepinephrine levels showed that in general the two amines are present in the same parts of the brain, particularly in the hypothalamus; however, in some areas a preponderence of serotonin in relation to norepinephrine was found. Such areas include the hypnogenic zone of Hess, the amygdala, and the pyriform cortex.

These studies of the distribution of norepinephrine and serotonin suggest that the amines act mainly in subcortical brain areas, but with the exception of the few instances cited above there was no discrete separation of the regions that contain each amine.

A somewhat simpler system than the brain in which the function of norepinephrine could be studied was at peripheral sympathetic ganglia. Since both these ganglia and the central nervous system are derived from the same embryologic tissue, a study of the role of norepinephrine in these ganglia might provide a clue to the action of this amine in the central nervous system.

Depletion of ganglionic norepinephrine by means of reserpine caused a facilitation of transmission. Contrastingly, when a high level of free norepinephrine in ganglia was produced by administration of reserpine after pretreatment with a monoamine oxidase inhibitor, a suppression of synaptic transmission occurred. In addition, large doses of adrenergic blocking agents and Bretyllium, a compound shown to inhibit the release of norepinephrine, also caused a facilitation of ganglionic transmission. These results are in accord with the view that norepinephrine modulates synaptic transmission and suggested that norepinephrine exerts an in-

hibitory influence in sympathetic ganglia by modulating the effects of the primary neurohormone acetylcholine. A question of perhaps greater significance is whether norepinephrine and serotonin in the brain also serve as modulators of synaptic transmission.

Available evidence indicates that catechol o-methyltransferase is the enzyme mainly responsible for the metabolism of circulating catecholamines. Experiments reported in this dissertation support the view that monoamine oxidase is the enzyme mainly responsible for the inactivation of norepinephrine and serotonin in nerve tissue. This was shown by the rise in ganglionic and brain norepinephrine and brain serotonin caused by the administration of a monamine oxidase inhibitor and by the inhibition of the metabolism of the amines released from ganglia and brain by reserpine administered to animals pretreated with a monoamine oxidase inhibitor. In contrast, pyrogallol, a catechol o-methyltransferase inhibitor, neither prevented the metabolism of brain norepinephrine released by reserpine nor caused an increase in the level of this amine in brain.

Studies were carried out on the rate of synthesis of brain norepinephrine and serotonin, in various species, as reflected by the rapidity with which a monoamine oxidase inhibitor caused an increase in the brain levels of these amines. Serotonin was synthesized rapidly in all the species studied; whereas norepinephrine biosynthesis in various animals is variable and lies in the following order: rat > rabbit > dog and cat. Since dopamine, the precursor of norepinephrine, increased rapidly in all the species studied, the rate-limiting step in the formation of norepinephrine is its conversion from dopamine.

Binding of norepinephrine and serotonin by nerve tissue can be considered the final step in their biosynthesis, since it is necessary for their stabilization in cells. Previous studies have shown that serotonin is released from platelets and brain by reserpine which interferes with its storage. In the present study, reserpine has been shown to also impair the capacity of the brain to store dopamine.

The importance of storage mechanisms for amines was suggested by studies which showed that the brain levels of norepinephrine and serotonin in newborn rats, born with poorly defined behavioral patterns, were only a fraction of the levels in adult animals. In contrast, guinea pigs, born with highly developed behavioral patterns had brain amine levels almost equal to those of mature animals. The following data support the view that the low amine levels in newborn rats is due to a deficiency in the storage mechanisms for these amines.

1. The low levels of brain monoamines in newborn rats did not arise from a low activity of DOPA-5-hydroxytryptophan decarboxylase, since in the brain of the newborn this enzyme is as active as in the adult.

2. The monoamine oxidase activity in the brain of newborn rats was only 30 per cent of that of adults. The low amine levels in newborn rats could not be explained by this lower activity of monoamine oxidase.

3. The administration of a monoamine oxidase inhibitor caused the brain levels of norepinephrine and serotonin to increase at the same rate in both newborn and adult rats; but the absolute increase was smaller in the newborn. These results suggest that the amines were rapidly formed in the newborn but that the young lacked an efficient storage mechanism.

CHARACTERISTICS OF VARIOLA VIRUS IN TISSUE CULTURE

by JAMES BRYAN PIRSCH*

Because of marked similarities between certain members of the Poxvirus group, it is tempting to extrapolate from various physical, cytopathological, and developmental characteristics of other poxviruses to variola virus. Such data have not always been corroborated by parallel studies with the more virulent virus, which is a distinct biological entity. Tissue culture methods offered the opportunity to demonstrate new characteristics of variola virus and to investigate basic host-variola virus interactions at a cellular level. It remained an ancillary objective to determine, if possible, the cellular bases for those properties already established in the intact animal host.

A number of cell lines, grown in both monolayer and suspended cell cultures, were examined for their capacity to support the growth of variola virus. All cell lines tested were found to be susceptible to infection, although to varying degrees. No correlation could be made between the capacity of a cell line to produce virus and its animal origin or cell type. It was found, generally, that the maximal titers obtained were proportional to the inoculated dose of variola virus. It was suggested that secondary cycles of infection were not occurring, perhaps owing to the presence of interfering substance(s), or to the presence of a noninfectious interfering virus particle. A possible third explanation was based on the aging of the host cell culture which lessened the susceptibility of uninfected cells. Definitive data were not offered.

A high dose (10^6 PFU per ml) always produced a cytopathogenic effect. A lower inoculum (10^4 PFU per ml) had an equivocal effect at best. Only the Maben cell line and primary cultures of adult hamster kidney responded to the lower inoculum. There was no correlation between the cell's sensitivity to a cytopathogenic effect and its capacity to produce maximal amounts of infectious virus. The formation of hyperplastic foci, first seen in monolayer cultures of porcine kidney cells and later in HeLa cells, was considered to be an unusual expression of cytopathology.

Based upon an enumeration of the hyperplastic foci formed in monolayer cultures of infected HeLa cells a new tissue culture assay for variola virus has been developed. Heating the virus suspension at 56 C for 30 min decreased by 99 per cent the number of foci formed by the unheated sample. Similarly, contact with immune serum effected a 90 per cent reduction in the number of foci. A straight line

* A.B. 1949, University of Minnesota; M.S. 1952, St. Louis University; Ph.D. conferred February 22, 1962. Director of research: Arthur Brown, *Chief, Branch II, Virus and Rickettsia Division, Fort Detrick; Research Consultant in Virology, The Graduate Council.* Co-director of research: Mary Louise Robbins, *Professor of Microbiology*).

relationship was demonstrated between the number of foci formed and the concentration of variola virus present in the suspension being assayed. The precision and the sensitivity of the tissue culture technique and the classical pock assay procedure utilizing the chorioallantoic membranes of embryonated chicken eggs. The sensitivity of the tissue culture assay was approximately four times greater than that of the egg procedure, since the mean count of hyperplastic foci (233) exceeded the mean pock count (53) by this value. In addition, statistical analysis established the greater precision of the tissue culture assay.

The adsorption of variola virus to monolayer cultures of HeLa cells or guinea pig lung cells required approximately 4 hr at 35 C. This value was obtained by measuring the increasing amounts of virus found associated with susceptible guinea pig lung cells at short time intervals after their infection. A similar adsorption time was demonstrated by following at close intervals after infection the increasing amounts of variola virus which resisted washing from monolayer cultures of HeLa cells. Cell-associated virus went on to form hyperplastic foci which were easily counted.

Intracellular replication of variola virus began after 8-12 hr of infection and progressed logarithmically until maximal intracellular concentrations of virus were achieved, about the 24th hr of infection. Growth curve studies with infected HeLa cell cultures demonstrated that concentrations of variola virus which appeared in the extracellular medium ranged from only 1:100 to 1:1000 of those found intracellularly. With the guinea pig lung cell line, however, after the 72d hr of infection, equivalent amounts of variola virus were detected both intra- and extracellularly.

The development of variola virus inclusion bodies within infected HeLa cells coincided with the quantitative formation of infectious virus. The first inclusions were seen at a time (8 hr after infection) when viral replication was first detected. After 12 hr of infection, these inclusions were more frequently detected. Observations of multiple inclusions within a single cell and of localized foci of infected cells were made midway (16 hr after infection) through the logarithmic phase of viral multiplication. By the 24th hr of infection, inclusion bodies were of frequent occurrence; some forms then appeared irregular in formation and less homogeneous in composition.

One of the distinguishing traits of variola virus, which has assumed diagnostic significance, is the inability of this virus to survive serial passage in laboratory animals. It seemed appropriate, therefore, to attempt the passage of this virus in tissue culture systems to re-examine the phenomenon at a cellular level, taking advantage of concurrent experiments detailing kinetic aspects of viral adsorption, replication, and release.

Increasing amounts of virus had been demonstrated in the supernatant culture fluids of guinea pig lung cells three days after their infection with variola virus. Although advantage was taken of this timing, supernatant fluids from infected cultures failed to promote the serial passage of variola virus. Passages of infected supernatant fluids diluted 1:10 and 1:300 were also attempted, but, while the activity of classical interferon, or other interfering substances, should have been diminished, successful passage of variola virus was not achieved.

Suspensions of variola virus prepared by disrupting infected cells with sonic

energy have served very well to perpetuate the course of the viral infection. The most obvious explanation for this success was that greater yields of virus were able to be obtained from within infected cells than from the infected culture fluid. The behavior of intracellular virus populations after brief storage in the frozen state, and the finding that intracellular virus could initiate a successful passage series even after extensive dilution suggested that qualitative differences might exist between intracellular and extracellular viral populations. Limited attempts to demonstrate some factor within cells which would account for the apparent qualitative difference were unrewarding.

SOME RESULTS IN LIFE TESTING BASED ON HYPERCENSORED SAMPLES FROM AN EXPONENTIAL DISTRIBUTION

by HOWARD RICHARD ROBERTS*

Employing the concept of a singly censored sample as one of known size n for which all variate values $X_i > X_c$ are unknown and all $X_i \leq X_c$ are known (single censorship on the right), the concept of a singly censored sample is generalized to that of what the author terms a hypercensored sample. A hypercensored sample is defined as one of known size n for which some (a known number) of the variate values in each of several intervals have unknown values. Three types of hypercensored samples arising in life testing experiments are pointed out: (1) those in which a fixed number of test items $k_1, k_2, \text{—}, k_r$ are withdrawn from the life test at successive failure times $X_1, X_2, \text{—}, X_r$, respectively; (2) those in which a fixed number of items $k_1, k_2, \text{—}, k_s$ are withdrawn from the life test at successive fixed times $t_1, t_2, \text{—}, t_s$, respectively; and (3) those in which withdrawals occur completely randomly according to some probability density function $g(X', \Phi)$. The only previous work in this area is due to Herd, Sampford, and Hartley, all of whom consider the problem of estimating the population parameters. These authors have treated various parts of the hypercensorship estimation problem under the terms "multiple censorship," "partial truncation," and "incomplete data."

In this dissertation, the standard types of life tests, treated in a logical sequence,

* B.S. 1935, M.S. 1957, The George Washington University; Ph.D. conferred February 22, 1962. Director of research: Frank Mark Weida, *Professor Emeritus of Statistics in Residence.*

are generalized from the single censorship case to the hypercensorship case, using as a basis for the generalization the type (1) hypercensorship case. The underlying distribution of failure times is assumed to be given by the exponential probability density function, $f(X) = (1/\theta)\exp(-X/\theta)$, and simple and composite hypotheses concerning the parameter θ (the mean life) are treated along with various other test characteristics. For each type of test considered the results derived for the hypercensorship case are compared with those for the single censorship case and numerical examples are given. Results in the single censorship case are due mainly to Epstein and Sobel.

For the life test in which testing is terminated after a fixed number of failures, r, have occurred the maximum likelihood estimate of the mean life, $\hat{\theta}$, is derived. It is then shown that $2r\hat{\theta}/\theta$ is distributed as a Chi-square variate with 2r degrees of freedom. The best critical region (in the Neyman-Pearson sense) for the test H_0: $\theta = \theta_0$ against H_1: $\theta < \theta_0$ is derived and the operating characteristic function is determined.

The distribution of the rth out of n failure times, $g(X_{r,n})$ is shown and the expected value, $E_{\theta}(X_{r,n})$ is derived. An approximation equation for $E_{\theta}(X_{r,n})$ is also given. These results are extended to the test of H_0: $\theta = \theta_0$, H_1: $\theta = \theta_1$ (θ_1 a specified value less than θ_0) and required values of r along with appropriate critical regions are tabulated for various values of α, β, and θ_0/θ_1.

It is noted that in the maximum likelihood estimate of θ the rth failure time, $X_{r,n}$, is weighted more heavily than smaller failure times. This suggests the possibility of a test of H_0: $\theta = \theta_0$, H_1: $\theta = \theta_1$ based on $X_{r,n}$ only. An exact test of this form based on $g(X_{r,n})$ is derived but is shown to be computationally difficult. Consideration is also given to an approximate test based on the unbiased estimate of θ, $\rho X_{r,n}$, where $\rho = \theta/E_{\theta}(X_{r,n})$. However, this estimate is shown to be relatively inefficient.

The test based on $X_{r,n}$ only has an acceptance region of the form $X_{r,n} > C$. Thus if the rth failure has not occurred by time C the test is terminated with acceptance of H_0 at time C. Termination of the test at the a priori time C leads to the development of the so-called "time truncated" test in which testing is terminated at $\min(X_{r_0}, T_0)$, with acceptance of H_0: $\theta = \theta_0$ if $\min(X_{r_0}, T_0) = T_0$, and with rejection of H_0 if $\min(X_{r_0}, T_0) = X_{r_0}$, where r_0 and T_0 are preassigned constants. The difficulties associated with the test based on $X_{r,n}$ only are shown to persist here but can be resolved easily in the special case where failures and withdrawals are replaced. The expected number of failures required to reach a decision, $E_{\theta}(r)$, and the expected waiting time to reach a decision, $E_{\theta}(T)$, are derived for this special case. Appropriate values of r_0 and n for various values of α, β, θ_0/θ_1 and T_0/θ_0 are tabulated.

The fact that the life test can be terminated at the preassigned time T_0 (with acceptance of H_0: $\theta = \theta_0$) leads to a modification of the test based on the first r failures whereby an acceptance decision can be made between failure times and always before $X_{r,n}$. This modification results in a test based on the total item life

accumulated up to time t, T(t). Results are obtainable in a straightforward manner in the hypercensorship case for the critical region, the expected number of failures required to reach a decision, $E_{\theta}(r)$; the expected waiting time to reach a decision, $E_{\theta}(T)$; and the operating characteristic function, $L(\theta)$.

For the sequential life test, it is pointed out that Wald's results are immediately applicable to the variable of interest (the time to failure of an item). However, the sequential life test is formulated in a so-called "semicontinuous" form to take advantage of the ordered nature of the failure times. In this context, the sequential test of H_0: $\theta = \theta_0$ against H_1: $\theta = \theta_1$ consists of placing n items on life test and making a decision to accept H_0, accept H_1, or continue the life test continually as time passes. These decisions are shown to be dependent on the accumulated item life T(t), the sequential life test being essentially an extension of the modified test based on the first r out of n failures. The usual characteristics of a sequential test are shown to be obtainable in a straightforward manner. Test characteristics include the sequential probability ratio, the operating characteristic function, and the average sample number function. In addition, the expected total item life required to reach a decision $E_{\theta}[T(t)]$ is derived and an approximation equation for the expected waiting time to reach a decision $E_{\theta}(t)$ is developed. Truncation of the sequential test after a specified number of failures, r_0; a specified amount of total test time, T_0; and a combination of r_0 and T_0 are also considered and upper bounds for the resulting modified error probabilities are derived.

As areas for further research, the type (2) and type (3) forms of hypercensorship are emphasized and certain preliminary results and suggested approaches are given. The need for further research in the hypercensorship case for other lifetime distributions such as the Weibull and normal distributions is cited. It is pointed out that multiparameter distributions under various forms of censorship usually require iterative methods for the solution of the maximum likelihood equations, and little is known about the small sample distribution of the resulting estimates. Other hypothesis testing situations ranging from the equality of two population mean lifetimes to factorial experiments in life testing situations are pointed out. Goodness-of-fit tests concerning the assumption of the underlying distribution are mentioned and finally the use of nonparametric methods is pointed out.

STUDIES ON THE REACTION OF BIS-B-CHLOROETHYL SULFIDE WITH PURINES, PYRIMIDINES, AND POLYNUCLEOTIDES

by ROBERT SANFORD ROZMAN*

The mechanisms by which foreign substances act on living cells are of interest from both theoretical and practical standpoints. The gross effects of mustard gas have been known for years, and a number of theories have been advanced to account for these. Some of the early theories, such as action via either hydrochloric acid or sulfone formation, were soon abandoned. Other theories, such as attack by mustard gas on proteins and nucleic acids, have been advanced and aspects of them subjected to experimental analysis. The research reported here was carried out in order to characterize compounds formed by the attack of mustard gas upon nucleic acid purines and pyrimidines.

Preliminary research was performed on the reaction of mustard gas with the five major purine and pyrimidine bases *in vitro*. These bases were incubated with sulfur mustard in varying proportions and the resultant compounds were separated utilizing two-dimensional paper chromatography. Visualization of the spots was accomplished by means of radioautography and/or ultra-violet photography. After reaction at least 7, 3, 6, 5, and 2 alkylated products could be demonstrated for guanine, adenine, cytosine, uracil, and thymine, respectively. It is believed that some of these compounds were oxidation products of compounds formed by the original reactions. The instability of some of these products is shown by the ready formation of additional compounds not found in the original mixture after treatment with Dowex 50 resin. The large number of products obtained again emphasized the strong reactivity of mustard gas toward the purines and pyrimidines.

Attention was then given to the effects of sulfur mustard on tumor cells. It was shown that mustard gas in the concentrations used did not destroy Ehrlich ascites cells when incubation was carried out for 20 minutes *in vitro*. After mustard gas treatment in an artificial medium metabolic incorporation of both a protein and a pyrimidine precursor, however, was approximately 50 per cent of that observed in the absence of sulfur mustard.

After *in vitro* incubation of sulfur mustard-S^{35} with the ascites cells, radioactivity was found in all of the chemical fractions isolated—acid soluble (50 per cent), lipid (15 per cent), nucleic acid (11 per cent), and protein (24 per cent). Of the mustard gas associated with the nucleic acid fraction, approximately 35 residues were calculated to be attached per molecule of DNA with only 3 of these residues calculated to be firmly attached to the purine and pyrimidine moieties.

* B.S. 1955, M.S. 1958, The George Washington University; Ph.D. conferred February 22, 1962. Director of research: Clarke Davison, *Associate Professor of Pharmacology*.

Sulfur mustard-S^{35} was incubated with commercial nucleic acid, and ascites cells both *in vitro* and *in vivo*. Both DNA and RNA were isolated, the RNA being separated from the DNA of the cells by means of alkaline hydrolysis. Both the DNA and the ribonucleotides were subsequently hydrolyzed with perchloric acid, and the resulting purines and pyrimidines and their alkylated products were partially purified by adsorption to and elution from charcoal. The compounds present were separated by two-dimensional paper chromatography. Radioautography revealed the presence of the same 4 major alkylated products from both the DNA and RNA of all the sources used. Isotope dilution techniques demonstrated that 3 of these compounds, representing 60 per cent of the total, were guanine derivatives. The remaining compound was a cytosine derivative.

Chromatographic and ultra-violet spectrographic data indicated that all of the guanine derivatives were alkylated at position 7. It was demonstrated that all of the alkylated guanine could be attributed to either 7-(β-hydroxyethylthioethyl) guanine or its degradation—probably oxidation—products.

The cytosine derivative was purified chromatographically, and a series of chemical and physical investigations was carried out. Elemental analysis yielded a nitrogen to sulfur ratio of approximately 3 to 1, indicating one sulfur mustard residue per cytosine nucleus. Ultra-violet spectrographic data eliminated carbons 4 and 5 and the amine group as the site of alkyl attachment. Infrared spectrographic data ruled out nitrogen 1 and the carbonyl group, as well as the amine group, as the site of attachment. Chemical studies also tended to eliminate nitrogen 1 and the amine group. The infrared spectra also lent positive support to the assignment of nitrogen 3 as the position of alkylation. The compound was assigned the structure 3-(β-hydroxyethylthioethyl) cytosine.

It was concluded that the formation of these two alkylated bases *in vivo* could account for the mutagenic, carcinogenic, and carcinostatic properties of mustard gas.

FORGING DEMOCRACY IN MALAYA

by ARCHIBALD JOHNSON SAMPSON*

The main purpose of this study is to consider the principal strengths and weaknesses of parliamentary democracy in the Federation of Malaya, to determine its applicability to a nonwestern society faced with extensive political, economic, and social change, and to express some evaluated opinion on the durability of democracy in Malaya.

* A.B. 1935, Stanford University; A.M. 1946, University of California at Los Angeles; Ph.D. conferred February 22, 1962. Director of research: Wolfgang Herbert Kraus, *Professor of Political Science.*

The writer characterizes the majority party in Parliament, the Alliance, and the parties in opposition. The noncommunal, national nature of the Alliance is emphasized in contrast with the more limited appeal of the opposition parties which in general can not but be described as communal oriented. The program and leadership of each party is described.

A special section is devoted to the Malayan Communist Party, although it is an illegal party with little strength, in order to show how it has been against Malaya's interests ever since it was formed in the 1920's.

The chapter concludes with an explanation of why the political party system might be described as a developing two-party system, and a discussion of the need for an organized opposition in Parliament.

The writer believes that the Federation's political system provides the people with enough power to be able to control the government, elect an organized opposition, and to express either consent to or dissent from the policies of the government.

The writer then, in describing the sources of strength in Malaya's parliamentary democracy, explains how certain executive, legislative, and judicial functions increase the chances for the success of democratic government in the Federation.

Among the particular subjects discussed as powers of the people or government are: registration, voting, particular powers of the Paramount Ruler which ensure democratic and controlled executive procedures, the purpose and powers of the Cabinet, passage of legislation, constitutional amendments, the advisory and review role of the Supreme Court, and the special constitutional authority for the federal government to have particular powers concerning land and development plans.

The chapter concludes with an enumeration of the fundamental liberties guaranteed to citizens by the constitution, but the writer contends that these are meaningless unless citizens carry out their duties and obligations through their power to participate in government.

The government of the Federation engages in economic planning. In the past, it has had the assistance of the International Bank for Reconstruction and Development, and it is expected that its assistance will be available in the future. The chapter outlines the generalities of the first five-year plan, and comments on the preliminary planning of the second five-year plan. In order that the extent of planning has some meaning to the reader, the first part of the chapter provides a general description of the economy of Malaya.

The chapter concludes with an explanation of initial developments in the industrial sector, the first steps that are being taken to develop the rural economy, the requirements for transportation, power, and communications to be effective, and finally how the Federation is acquiring both a sufficient number of persons with technical skills and also capital to finance economic development.

The last substantive chapter is an examination of those social services which are considered necessary by citizens and are accepted activities for modern governments. It discusses public health and medical care, social welfare, social security, housing, labor, and education. One of the most important conclusions reached is that non-governmental organizations have an effective and responsible

role in seeking to advance the position of the less fortunate members of society. Through actions such as these, parliamentary democracy is strengthened.

In conclusion, Chapter IX, the writer makes several observations on the basic strengths of parliamentary democracy in the Federation:

The form of government in Malaya has been well adapted to local traditions; and, as a result, the Federation may be better able to vindicate democracy than can any other Southeast Asian nation.

Although communal interest groups in Malaya are strong, conditions do exist that offer excellent opportunities to reduce their importance.

The methods to moderate and minimize the numbers of active political parties do exist; and, as a result, the political party system in Malaya has a better opportunity to develop into a two-party system than do the party systems elsewhere in Southeast Asia.

Federal power is sufficient to enable parliamentary government to be effective.

It is believed, also, that the present government has accepted its economic and social responsibilities in a manner which is conducive to success.

Finally, the writer believes that democratic government in Malaya meets the criteria for democracy sufficiently well so that it can be expected that parliamentary democracy in Malaya has a chance to succeed.

ABNORMAL DEVELOPMENT OF THE EARLY CHICK EMBRYO DUE TO INFLUENZA A VIRUS: AN HISTOCHEMICAL ANALYSIS

by JAMES BLAKE THOMAS*

It has been well established that a variety of specific agents are capable of inducing abnormal development when administered at critical periods of embryogenesis. Some of these agents, such as the alkylating agents and the antimetabolites, are known to alter cell reproduction and cell metabolism, but at present there is no acceptable theory to explain the basic mechanisms of abnormal development. This dissertation has presented an histochemical approach to one specific case of abnormal development in an attempt to elicit data which might offer a basis for such a theory.

* A.B. 1952, Wabash College; M.S. 1958, The George Washington University; Ph.D. conferred February 22, 1962. Director of research: Frank Duane Allan, *Associate Professor of Anatomy.*

On the basis of the experimental data it has been suggested that in the chick all tissues and organs undergoing rapid development at the time of insult are adversely effected by exposure to the influenza A virus with resulting retardation of development or abnormal developmental patterns. Also, under the conditions of this experiment there is no obvious quantitative change of DNA, RNA, alkaline phosphatase, or nonspecific esterase associated with the observed abnormal development; and if abnormal development is dependent wholly or partially on altered enzyme patterns or alterations of DNA and or RNA, then alkaline phosphatase and the esterase do not seem to be involved in this particular case and any alteration of DNA or RNA must be qualitative or quantitative at a very low level.

Finally, interpretations of possible mechanisms of abnormal development have been presented with the suggestion that:

1. The virus may grow extra-embryonically and so compete with the developing embryo for substrate.

2. The virus or some by-product of the virus may be directly toxic to the developing cells.

3. The virus invades the developing cell and then either competes with developing proteins for substrate or acts as a foreign molecule of RNA thus initiating the production of abnormal cell constituents including enzymes.

Support has been gvien for the latter hypothesis and a discussion of the present investigation, as well as earlier investigations, has been given within the framework of this hypothesis.

SOME BIOCHEMICAL STUDIES OF THE FIRST COMPONENT OF COMPLEMENT

by GEORGE HENRY WIRTZ*

Complement is a group of substances found in serum which take part in various immunological reactions and with the appropriate antibodies will kill certain susceptible bacteria and protozoa, lyse erythrocytes, immobilize treponemes, and promote phagocytosis. For many years it has been known that complement (C′) consists of at least four components: C′1, C′2, C′3, and C′4. More recently others have been found.

* B.S. 1953, M.S. 1956, University of Wisconsin; Ph.D. conferred February 22, 1962. Director of research: William Robert Carroll, *Professorial Lecturer on Proteins;* Co-Director: Joseph Hyram Roe, *Professor Emeritus of Biochemistry in Residence.*

The reaction of complement with erythrocytes sensitized with hemolytic antibody leads to cellular damage and the release of hemoglobin. The sequence of reaction of the components of complement with the sensitized erythrocytes is the following: C'1, C'4, C'2, C'3. The reaction of erythrocytes with antibody and then with complement to yield hemolysis has been assigned the term immune hemolysis. Immune hemolysis possesses certain similarities to the allergic reaction at the cellular level. The latter consists of an antigen-antibody reaction on tissue cells which leads to cell damage and the release of histamine and other pharmacologically active materials which may be responsible for the symptoms of allergy. Because of these similarities the system comprising sensitized erythrocytes (EA) and complement has been chosen as a model for a biochemical study of the mechanisms of allergy. In the present work studies on the EA-C'1 bond are reported, together with a method for partial purification of C'1.

The properties of the linkage between guinea pig C'1 and the sensitized sheep red cell were approached in two ways: (1) by means of the susceptibility of the linkage to aliphatic diamines and (2) by virtue of the fact that Ca^{++} is intimately associated with the bond. The study of diamines stemmed from a previous observation that L-lysine ethyl ester will inhibit the action of complement. In this work it is shown that L-lysine ethyl ester acts specifically to break the EA-C'1 bond or prevent its formation; further investigation revealed that the structural components responsible for this activity were the two free amino groups. The role of divalent cations such as Ca^{++} was studied because it has long been known that they are necessary for the interaction of complement with sensitized red cells.

When red cells sensitized with hemolytic antibody are treated with complement in the cold, only components C'1, C'4, and C'2 are fixed and lysis does not occur. If L-lysine ethyl ester is present during the reaction the fixation of all three components is inhibited. But if sensitized cells possessing these three components (EAC'142) are first prepared and then treated with L-lysine ethyl ester, C'1 is removed from the complex but not C'4 or C'2. Several diamines were also found capable of this selective removal of C'1. When EAC'1 cells were treated with diamines with carbon chain lengths varying from 2 to 8 carbons (with the amino groups on the terminal carbons) the 3 to 8 carbon compounds removed C'1 with about equal facility. The 2 carbon diamine was less than half as active as the others. When monoamines were compared to diamines of the same carbon chain length they were found to be only one third as active.

It had been observed previously that the ethylenediaminetetraacetic acid (EDTA) would remove C'1 from sensitized cells possessing C'1 and C'4 (EAC'14) and this C'1 could be recovered from the solution in an activated state (C'1a) possessing esterase activity. In the present work a similar finding was made using butanediamine. The rate of removal of C'1 from EAC'1 by butanediamine was such that in the first ten minutes the removal was rapid, after which it slowed down and followed first order kinetics.

By a method analogous to that introduced by Lineweaver and Burk for studying enzyme kinetics evidence was obtained suggesting that C'1 and butanediamine compete for the same site on EA. This was done by treating EA with various levels

of C'1a in the presence and absence of diamine and showing by graphical means that all the diamine would probably be displaced at a C'1a concentration of infinity.

EAC'1 cells were usually studied in a buffer containing 1.5×10^{-4} M Ca^{++}. When the Ca^{++} concentration was raised to 1.1×10^{-3} M the ability of butanediamine to remove C'1 was very much reduced. This result is in accord with earlier work which suggested that Ca^{++} is required for the binding of C'1 to the cell. To further test this hypothesis EAC'1 cells were exposed to buffer which contained no divalent cations. It was found that the C'1 content of the cells dropped. This decrease in C'1 could be brought to an immediate halt by restoring divalent cations. The ability of various divalent cations to maintain the C'1 level of EAC'1 cells was compared. Of those tested, Ca^{++} was the most effective. Zn^{++}, Sr^{++}, Cd^{++}, and Mg^{++} also maintained the C'1 activity to a greater or lesser extent. Ni^{++}, Co^{++}, and Ba^{++} did not maintain it and even caused it to decrease.

On the basis of this the following picture of the EA-C'1 linkage is tentatively suggested. The reactive sites of both EA and C'1 possess a constellation of negative charges and these two sites are held in close proximity by means of calcium ions which possess two positive charges each. The suggested picture is: EA$--+$ Ca $+-$C'1.

This is probably the simplest picture that can be formulated to account for the observations summarized above. At the pH of the reactions (about 7.3) butanediamine is positively charged ($+NH_3-R-NH_3+$). This accounts for the ability of the diamine to compete with C'1 (in the presence of excess calcium) for the site on EA. Since diamines can cause the removal of C'1 from EA, it seems reasonable to assume that the EA$-$C'1 bond is dissociable and in the presence of diamine, C'1 is prevented from reassociating with EA. The fact that diamines are more effective than monoamines in removing C'1 from EA might indicate that the loci of negative charges on EA occur in pairs, and inhibition is more efficient when both areas of negative charge are neutralized simultaneously.

The intimate role of Ca^{++} in the EA$-$C'1 bond is suggested by the observations (1) the C'1 activity of EAC'1 is diminished in the absence of Ca^{++} and (2) an increase in Ca^{++} concentration decreases the effectiveness of diamines in removing C'1 from EAC'1.

In order to extend the study of the interaction of C'1 with EA, it would be advantageous to have C'1 free of the other factors in serum. For this reason an attempt was made to purify C'1 from guinea pig serum. A method was developed for the partial purification of C'1 which consisted of making an ethanol precipitate of serum, suspending the precipitate in buffer and passing over a DEAE-cellulose ion exchange column, and making an ethanol precipitate of a fraction of the column eluate. A recovery of 25 per cent C'1 was obtained by this method and a purification of 50 fold. The partially purified C'1 contained only a small amount of C'4 and no detectable C'2 or C'3. When subjected to starch gel electrophoresis two bands resulted. Paper electrophoresis revealed only one band, and the C'1 activity was found associated with that band.

During passage over the DEAE column there was reason to think that nonideal ion exchange chromatography was taking place. One reason for suspecting this was

that the chromatographic run was very rapid, being complete in ten minutes or less. (This rapidity was necessary to avoid loss of C'1 activity on the column.) The non-ideal nature of the chromatography was further suggested by the following experiment. A DEAE chromatographic run was carried out as usual. Such a run resulted in a spread of C'1 activity over a fairly wide ionic strength range. Several C'1 fractions of this run were isolated and rechromatographed under the same conditions as the original run. It is probably significant that each of the C'1 fractions yielded essentially the same pattern on rechromatography, suggesting that the C'1 did not vary qualitatively from one fraction to another. Thus conditions were such that what was probably a single species of C'1 failed to come out in a narrow ionic strength range as would be expected under ideal ion-exchange conditions.

FACILITATION AND INTERFERENCE IN CONCEPT FORMATION

by BERTIE HAROLD REGINALD WOOLF*

A study was made of the process of concept formation, as inferred from the measurement of verbal problem-solving behavior. A set of postulates was formulated in order to account for the process in terms of a mediation theory of concept learning.

An experiment was performed in order to examine the predictive and explanatory value of the postulates and also to obtain further information concerning the characteristics of the process of concept formation as it evolves through time.

A set of 24 perceptually similar anagrams with unequivocal solutions was constructed so that each of four sets of six anagrams exemplified a discrete verbal category or 'concept.' The anagrams, printed on 3 X 5 stimulus cards, were presented one at a time in counterbalanced order, and the time for solution was recorded. A limit of 150 seconds per anagram was imposed. Concept formation was inferred from the speed of solution; interference, or 'set,' was inferred upon a slow-down in solution-time.

Ss were volunteer college students, 48 of each sex, who were unaware of the purpose of the experiment; the only requirement was ability to solve anagrams. A questionnaire was administered at the completion of the examination.

* A.B. 1955, A.M. 1957, The George Washington University; Ph.D. conferred February 22, 1962. Director of research: Thelma Hunt, *Professor of Psychology*.

The results of the experiment were graphically displayed. The distributions of solution-time scores were observed to be positively skewed. The data was considered representative of the process of concept formation: specific components of the process were subjected to tests of statistical significance. Positive results of the tests supported the verification of the following set of four general hypotheses:

1. Concept formation can be measured reliably in units of time in association with units of related performance.

2. A stable and distinctive curve of concept formation can be derived, reflecting the following characteristics: (a) the process will form at a relatively slow rate, (b) the rate will increase rapidly as cue-acceptance takes place, (c) the rate will tend to approach a limit as the concept is attained.

3. The isolation of the concept will result in a temporary 'mental set', causing interference in the establishment of a competing concept.

4. The process will commence anew as the competing concept achieves perceptual dominance.

Specific results of the experiment included the following:

1. A functional relationship was obtained between the order of presentation of an anagram and the time required for solution.

2. The rate of the time required for solution of an anagram was shown to increase as the number of instances of the concept increased.

3. The rate tended to approach a limit as the number of instances increased.

4. Significant differences were shown to exist between median solution-times according to their position in the order of presentation of stimuli.

5. The anagrams and concepts were ranked according to their difficulty value.

6. Two sets of measures were derived from the solution-time scores: (a) total number of failures per subject and (b) total quartile score per subject. A high positive correlation was shown to exist between the two measures.

It was concluded that within the limits of proof imposed by a theory of concept formation, evidence had been obtained in support of the set of four general hypotheses and for the postulates from which they were derived.

Evidence was also obtained concerning other hypotheses suggested by the results of previous studies:

1. A significant difference was shown to exist between sexes with respect to the solution of anagrams: on the average, females failed more anagrams than males.

2. A hypothesis that an observed relationship between sets of concepts will result in a gradual decrease in 'set' was not confirmed within the limits of the study.

3. A hypothesis that the process varies according to such group characteristics as amount and type of previous training was also examined but not confirmed within the limits of the study.

An interpretation of the results of the experiment was made in terms of the reduction of 'uncertainty.'

Further implications for theory and suggestions for future research were discussed.

A final discussion considered the implications of the results, and suggestions were made concerning possible future research.

STUDIES ON DOPAMINE-B-OXIDASE

by CYRUS ROBBINS CREVELING*

The major biosynthetic pathway for the formation of the adrenergic transmitter, norepinephrine, from its ultimate precursor, tyrosine, has been demonstrated by radioactive tracer techniques. This pathway involves three steps, the last of which, the introduction of a hydroxyl group on the *beta* carbon of 3, 4-dihydroxyphenethylamine, is catalyzed by the enzyme, dopamine-β-oxidase. Previously, the formation of norepinephrine catalyzed by this enzyme had been demonstrated in tissue preparations of the adrenal medulla and sympathetic nerves and ganglia. Studies with a partially purified preparation of dopamine-β-oxidase had established that the formation of norepinephrine requires stoichiometric amounts of molecular oxygen and ascorbic acid and that ascorbic acid is converted to dehydroascorbic acid during the reaction.

Studies on the localization of dopamine-β-oxidase indicated that it is also present in the central nervous system, in the caudate nucleus, and hypothalamus. A study of the intracellular localization of the enzyme in the adrenal medulla indicated that it is closely associated with the chromaffin granule fraction. The measurement of enzyme activity in crude homogenates was shown to be complicated by the presence of an endogenous inhibitor. Studies on the nature of this inhibitor indicated that it is dialysable and extremely labile in the absence of tissue protein. The possible role of such an agent in the physiological control of the rate of norepinephrine biosynthesis was discussed.

The formation of norsynephrine, a pharmacologically active amine previously found in the salivary gland of the octopus and called octopamine, was demonstrated in tissue preparations which have dopamine-β-oxidase activity. Studies with a purified preparation of dopamine-β-oxidase demonstrated that this enzyme is identical with the enzyme which catalyzes the *beta*-hydroxylation of tyramine to form norsynephrine. Further studies on substrate specificity indicated that this enzyme can catalyze the *beta*-hydroxylation of not only dopamine and tyramine but of many primary and secondary amines possessing the basic phenethylamine structure.

The demonstration of the nonspecific character of this enzyme has many implications concerning the biosynthesis and metabolism of normally occurring amines. Since tyramine was as good a substrate for dopamine-β-oxidase as dopamine, itself, it was postulated that tyramine is also a precursor of norsynephrine *in vivo*. In addition, it appeared conceivable that *meta*-hydroxylation of norsynephrine might occur, resulting in the formation of norepinephrine. Parental administration of iso-

* B.S. 1953, M.S. 1955, The George Washington University; Ph.D., conferred June 6, 1962. Director of research: Sidney Udenfriend, *Chief, Laboratory of Clinical Biochemistry, National Heart Institute; Research Consultant in Amino Acid Metabolism; Neurohormones, The Graduate Council.* Co-director of research: Harold George Mandel, *Professor of Pharmacology.*

topically labeled tyramine and norsynephrine to the rat resulted in the excretion of isotopically labeled norepinephrine, normetanephrine, and N-methylnorsynephrine. Based on these findings and supporting evidence indicating the presence of tyramine and norsynephrine in tissues, an alternate pathway for the biosynthesis of norepinephrine from tyramine through the intermediate formation of norsynephrine was proposed.

The demonstration that 3-methoxydopamine was converted to normetanephrine *in vitro* suggested that if 3-methoxydopamine was present in tissues its *beta*-hydroxylation might substantially contribute to the excretion of normetanephrine. This suggestion is supported by the recent finding that 3-methoxydopamine is excreted in human urine.

Many well known sympathomimetic drugs were shown to be excellent substrates of dopamine-β-oxidase. This finding is of pharmacological interest since in some instances the resultant product is a known drug with greater pharmacological activity. It was suggested that some of the pharmacological properties of the parent drug may be due in part to the formation of the oxidized product *in vivo*. The conversion *in vivo* of α-methyl-m-tyramine to the *beta*-hydroxylated product, aramine, supports this suggestion since much of the pharmacological action of α-methyl-m-tyramine is due to its conversion *in vivo* to the more active drug, aramine.

Many drugs implicated in the pharmacology of the sympathetic nervous system were previously thought to act by inhibiting the *beta*-hydroxylation step in the biosynthesis of norepinephrine. Studies with the purified enzyme demonstrated that compounds such as choline-2, 6-xylylether, Guanethidine, Bretylium, or Imipramine produced little, if any, inhibition of the enzyme. Therefore, it is questionable whether the pharmacological actions *in vivo* of such drugs are due to the inhibition of dopamine-β-oxidase unless an inhibitor is formed *in vivo* through metabolism of the drug.

A compound which could block the biosynthesis of norepinephrine *in vivo* would be a valuable pharmacological tool as well as of being of possible therapeutic value. Studies based on the structure-activity relationship of substrates of dopamine-β-oxidase demonstrated that compounds whose structural configuration was isosteric with phenethylamine and in which the *alpha* carbon was replaced by either nitrogen or oxygen were potent inhibitors of the enzyme. Furthermore, the inhibition was shown to be due to a competitive, irreversible binding of the inhibitor to the enzyme. Preliminary investigations indicated that these agents may be active *in vivo*.

To gain some understanding of the reaction mechanism of dopamine-β-oxidase the fate of the hydrogen atoms on the *beta* carbon of the substrate was determined. This was accomplished by using as substrates, dopamine and tyramine specifically labeled with tritium on the *beta* carbon. The results of these studies indicated that one of the *beta*-tritium atoms is released in the *beta*-hydroxylation reaction, the other tritium atom remaining on the benzyl carbon of the product. These findings allow the exclusion of some proposed mechanisms which involve a dehydrogenation of the side chain. In addition, it was demonstrated in experiments utilizing oxygen^{18} labeled water that the *beta*-hydroxy group of norsynephrine undergoes an exchange with the medium. A possible experimental approach for the determination of the source of the oxygen in the *beta*-hydroxy group was discussed.

FUNCTIONAL JOB ANALYSIS AS A METHOD OF INDIRECT VALIDATION: A STUDY IN SYNTHETIC VALIDITY

by SIDNEY ALBERT FINE*

INTRODUCTION

In recent years there has developed considerable dissatisfaction with empirical validation procedures for arriving at appropriate tests as predictors in the selection of suitable workers for jobs. The reasons for this dissatisfaction are two-fold: practical and theoretical. The practical reasons are concerned with the time and costliness of the empirical validation procedures which often, where only a few workers are being hired from time to time, makes it prohibitive to undertake. This is further complicated by the fact that the validity coefficients for the same test for a particular job are often inconsistent, contradictory, or even inexplicable. Thus, from a practical standpoint it would be desirable to have available another method of validation which could be used where empirical validation was out of the question.

The theoretical dissatisfaction comes from the fact that empirical validation procedures very often do not attempt to understand beforehand why the particular worker characteristics being measured should be selective of suitable workers and what weight they should have in relation to all the other characteristics the individual brings to the job. A battery of tests is simply given on a "try all and see" basis, the results correlated with the criterion, and statistical analysis applied to the results. This procedure has been criticized on the grounds that true scientific procedure requires a theoretical postulation of what an empirical validation will uncover so that (1) an understanding is available in advance from the current "state of the art" concerning what is being done and (2) the empirical validation is in effect a test of the psychological thinking that brought the test developer to that point.

BACKGROUND

Study of the literature indicated that the problem outlined above has been a central one since the beginning of the aptitude testing movement shortly after the First World War. The strictly empirical approach that made little systematic use of job analysis concentrated on developing tests of traits, obtaining measures of these traits on working populations, and relating them to some over-all rating or quantitative criterion of performance. However, right from the start the weaknesses of this approach were described by such men as Viteles who urged the importance

* B.S. in S.S. 1936, M.S. in Ed. 1941, College of the City of New York; Ph.D. conferred June 6, 1962. Director of research: James Norman Mosel, *Associate Professor of Psychology*.

of prior job analysis and some formulation of all traits relevant in human performance. Some workers in the field have felt that the best analysis of the job from the standpoint of worker qualifications was to give a battery of tests that presumed to measure all relevant traits and to note the difference in patterns of traits between (1) workers in different occupations and (2) the best and poorest workers in a given occupation. Paterson and associates at Minnesota and more recently Cattell at Illinois have pursued this line.

On the other hand, others have pursued an analytical approach seeking first to understand the job through some careful means of observation or description. Since the Second World War, there has been some improvement in old job analysis techniques and the development of some new ones such as critical incident, check list, and functional approaches. Since straightforward empirical validation procedure, which made only superficial use of job analysis, has been discouraging in the results it has produced for use in industrial and counseling psychology for predictive purposes, there has been greater interest in "rational" approaches that make use of job analysis for the purpose of predicting empirical validities. The purpose of job analysis to select predictors is essentially to use it to hypothesize the nature and requirements of human functioning in work situations followed by the use of tests to verify these hypotheses.

PROBLEM

The problem to which this investigation has addressed itself is the use of job analysis, specifically Functional Job Analysis (FJA), as a rationale for the selection of test predictors of suitability for employment. More specifically, it examines the technical problem of whether estimates of trait validities generated by FJA can be used to reproduce and replace the results obtained by the more expensive and time consuming methods of empirical test validation. This technical problem was defined as *synthetic validity*. Both industrial and counseling psychologists base some of their most crucial decisions on test validities and have been vitally concerned with this problem. Empirical validities, developed by traditional methods, have demonstrated definite inadequacies and limited usefulness in prediction situations. The major source of the difficulties, it has been suggested, has been inadequate use of job analysis in the initial stages of developing the predictor, namely, in the formulation of hypotheses as to why a certain amount of a trait measured by a test was necessary and what its relative importance was in relation to other traits conceived as making up the range of total performance. This dissertation proposed that Functional Job Analysis be used as a rationale to formulate such hypotheses.

FUNCTIONAL JOB ANALYSIS

Functional Job Analysis is an outgrowth of United States Employment Service efforts at developing a worker oriented (rather than technology oriented) occupational classification system. It is a job analysis approach that systematically analyzes work performed and worker trait requirements in terms of eight components. The language of these components, the definitions of factors included in each, and the methods of using them are carefully controlled. The analytical data produced by the eight components give a fairly complete picture of what workers do and how they function on a job.

Four thousand jobs have been analyzed according to these eight components, and this analysis has resulted in the development of a functional occupational classification structure that reflects a quite systematic relationship between what workers do and their estimated trait requirements. The classification structure and the worker function component and weighting scheme associated with it provide the basis for a rationale for determining the relative importance of various traits. The manual for the aptitude component provides bench mark situations from job descriptions for rating various degrees of each of the aptitude traits. The Functional Job Analysis rationale was developed on the basis of these components and the classification structure to predict the traits primary for success (norms) and their amounts on the basis of either observations or descriptive material. Previous studies had indicated that the estimating method was reliable. In one study the functional approach used informally was also successful in predicting the aptitudes that would be selected as norms by empirical validation. The present study incorporates functional techniques into a Functional Job Analysis rationale to test the validity of the method in predicting empirical aptitude test results, that is, to test its use in synthetic validity.

PROCEDURE

Functional Job Analysis was used (1) to estimate the amount of nine aptitudes required for average successful performance in each of eighty-five jobs and (2) to predict the few aptitudes (3, 4, or 5) that would be significant for selection, that is, would be selected as norm aptitudes by the empirical validation process.

The nine aptitudes are those measured by the General Aptitude Test Battery of the United States Employment Service. The eighty-five jobs were selected from about two hundred and eighty-five for which both empirical test data and estimates made from job definitions were available. A subsidiary problem investigated was whether estimates of amount and selection of norm aptitudes would more closely approach empirical validities if the material from which inferences were made were actual descriptions of the jobs on which tests were being validated rather than brief job definitions.

Two raters were used, one each in two different United States Employment Service offices. The purpose of two raters was to make another reliability check on the Functional Job Analysis procedure. A third rater, the author, followed the same procedure for ten jobs for which current (at the time this study was initiated) validation studies were being conducted. The purpose was to make both a quantitative and qualitative analysis of the Functional Job Analysis procedure in a predictive, as well as, concurrent situation.

A sample of eighty-five jobs was analyzed on a three-way basis; that is, comparison of aptitude estimates made from job descriptions, with estimates from job definitions and with test results. Slightly more than two-thirds of the jobs are in the skilled and semi-skilled industrial area and somewhat less than 10 per cent in the unskilled labor, service, and outdoor areas. The remainder of the jobs, about a fourth, are clerical and professional.

THE HYPOTHESES AND RESULTS

Six hypotheses were explored with the following results:

Hypothesis 1.—"Estimates of amount of aptitude made independently by two raters following the same technique from the same job descriptions will be closely similar and better than chance, confirming the reliability of the procedure."

The two raters overlapped with each other far better than would be expected by chance (median overlap 62 per cent, chance 20 per cent). The indications are that the raters consistently operated according to the rules provided and that the ratings are reliable. Hypothesis 1 was confirmed. However, the limitations of chance as a reference base for interpreting the results means that they must be accepted with caution. On a judgmental basis they do appear to be acceptable.

Hypothesis 2.—"Estimates of amount of aptitude made from job descriptions will be closer to test results than those made from job definitions but probably more like those made from job definitions than those made from test results." The two raters making estimates from job descriptions agree both with the raters making estimates from job definitions (median per cent overlap for Rater A was 71 per cent, for Rater B, 61 per cent) and with empirical results from test validation (median per cent overlap for Rater A was 60 per cent, for Rater B, 55 per cent) thus, the two raters' estimates were closer to the estimates made from job definitions. However, only Rater A's estimates from job descriptions were closer to the empirical validities (median per cent overlap for A was 60 per cent, for the estimates from definitions, 57 per cent, for Rater B, 55 per cent. This hypothesis was only partly confirmed.

Hypothesis 3.—"There will be no significant difference between estimates of amount made from job descriptions and empirical results." This hypothesis was confirmed at .05 level of confidence indicating that the Functional Job Analysis predictions of amount have an appreciable promise of synthetic validity.

Hypothesis 4.—"There will be no significant difference between the norm aptitudes selected by the FJA rationale and those developed by empirical validation. Actual differences will be small and within the limits of random error." This hypothesis was confirmed. All differences of observed results from those expected by chance were significant at the .01 level of confidence for both Raters A and B.

Hypothesis 5.—"Norm aptitudes selected from job descriptions will be more like the norm aptitudes of empirical validation than those selected from job definitions." Although Rater A's selections from job descriptions came closer to those developed by empirical validation than those made from job definitions, this did not occur for Rater B. Thus, hypothesis 5 was not confirmed.

Hypothesis 6.—For the most part Rater C will select the norm aptitudes emerging from empirical validation. This hypothesis related to the prediction study on ten jobs in which aptitude estimates were made before the processing of data from empirical studies. Rater C selected twenty out of the thirty (67 per cent) norm aptitudes selected by empirical validation. This was considered a confirmation of hypothesis 6 on judgmental grounds.

A qualitative analysis of the FJA rationale as a rule system indicated that it could be improved by more definitive programming. When this was done and com-

pared with the rule system implicit in empirical validating, it was found that there were fifty-nine out of ninety possible agreements between the two methods in the selection and nonselection of norm aptitudes. In short, the improved FJA rationale on judgmental grounds indicated further potential for synthetic validity.

SUMMARY OF DISCUSSION

1. Estimates of aptitudes from job descriptions or job definitions, made according to a formal procedure, tend to agree with each other and underestimate test results. It is likely that this agreement is due to the fact that when ratings are made of specific, well defined, but nonobservable parameters (in effect, concepts) supposedly present in a total situation like a job, it is the mediating verbalization associated with the concept that is rated rather than the situational detail which is observed or read about. The underestimating is probably due to (a) the estimation technique considering total population as a base whereas the base for empirical norms is the working population; (b) the possibility that samples in low-level jobs particularly, have more of an aptitude than is required by a job; and (c) the effects of the rules for estimating which must reflect situational content and, hence, would rate very low those aptitudes showing up in empirical norms but not reflected in definitions or descriptions.

2. Raters selecting three or four aptitudes out of nine as norms for selection purposes can approach the results of empirical validation significantly better than by chance, although chance is not a good base for establishing the significance of these results. Job descriptions appear to be helpful to the discriminating rater in making these selections.

3. The FJA rationale rates functional performance, that is, Thing, Data, People behaviors, and tends to minimize preparation for a job and general personality factors not directly related to functional behavior. Here it is necessary to allow for certain biasing effects when comparing FJA rationale selections with those made by empirical validation. (a) The more education, particularly high school or higher that is involved in or required by a job, the more the norm aptitudes will tend toward intelligence, numerical, verbal, spatial, and clerical factors and away from form perception, dexterity and coordination factors regardless of degree of involvement of these latter aptitudes. (b) The more the sample tends to satisfy certain minimal educational requirements, high school or higher regardless of type of job, empirical studies will tend to produce aptitude norms that include intelligence, verbal, numerical, spatial, and clerical factors and away from form perception, dexterity and coordination factors. (c) The above will also tend to be true if the criteria are school grades and supervisory ratings of a general nature.

4. The FJA rationale used for this study proved more effective than might be expected in predicting aptitude norms of validation studies. However, it can be expanded on an aptitude-by-aptitude basis to more carefully reflect the interaction on aptitudes of other components such as general educational development, interests, temperaments, and physical capacities. The resulting aptitude-by-aptitude program is not linear (straight line) but rather presents a number of specific criteria requiring simultaneous consideration (scanning) and a decision in terms of preponder-

ance of evidence. In other words, the selection of norm aptitudes is not a mechanical operation but rather in the final analysis a judgmental operation attempting to make use of all relevant data and their interaction effects. The initial use of the expanded rationale in this manner resulted in its selection of norm aptitudes with the same degree of consistency (on a judgmental basis) as with empirical validation.

5. Further research using the FJA rationale should not only apply the expanded programs but should also take some of the biasing effects of estimation and empirical validation into consideration.

6. In general, this study provides evidence for the usefulness of the FJA rationale as a means for arriving at synthetic validity, that is, predicting empirical validities. The predictions of FJA should probably be given as much consideration as the statistical criteria combined in arriving at final norms.

THE INFLUENCE OF ETHYL N,N-di-n-PROPYLTHIOLCARBAMATE (EPTC) ON WAX FORMATION IN CABBAGE

by WALTER ANDREW GENTNER*

Quantitative determinations show that ethyl N,N-di-n-propylthiolcarbamate (EPTC) inhibits the deposition of external foliar wax of cabbage. The amount of wax inhibition is correlated directly with the rate of application of EPTC. Differential inhibition of wax deposition served as a tool to show the importance of foliar waxes in inhibiting the absorption and penetration of pesticidal materials. When foliar waxes are inhibited, cabbage becomes more susceptible to treatments of the alkanolamine salts of 4,6-dinitro-o-sec-butylphenol (DNBP), a contact herbicide. It has been established that certain plants can be chemically preconditioned so that they are more susceptible to subsequently applied herbicidal sprays.

When EPTC is applied as a spray, only those leaves in the bud are affected. Leaf primordia developed after spray application are not affected. Granular applications of EPTC extend the period during which the formation of external foliar wax is inhibited.

* A.B. 1952, A.M. 1956, The George Washington University; Ph.D. conferred June 6, 1962. Director of research: Loran Leroy Danielson, *Plant Physiologist and Leader of Weed Investigations—Horticulture Crops, Agricultural Research Service, Department of Agriculture; Research Consultant in Plant Physiology, The Graduate Council.* Co-director of research: Lawson Edwin Yocum, *Professor Emeritus of Botany.*

The reduction of foliar wax results in an increase in spray retention and a decrease in the contact angle of spray droplets. Both of these factors at least partially explain the increase of susceptibility of cabbage plants preconditioned with EPTC to subsequently applied DNBP sprays.

The influence of EPTC in inhibiting foliar wax or its influence on physical-chemical properties of the cuticle results in an increase in the transpiration rate which is correlated to the rate of application of EPTC.

Cabbage leaves with reduced wax appear more susceptible to invasion by Rhizopus stolonifer.

AN INVESTIGATION OF RELATIONSHIPS BETWEEN COLLEGE AND SENIOR STUDENT CHARACTERISTICS AND PERFORMANCE ON THE APTITUDE AND AREA TESTS OF THE GRADUATE RECORD EXAMINATION AT THE GEORGE WASHINGTON UNIVERSITY

by JANET WILDMAN JOHNSON*

The purpose of this study was to investigate possible relationships between variables relating to The George Washington University (G.W.U.) college and senior student characteristics and the performance of these students on the Aptitude and Area Tests of the Graduate Record Examination (GRE). In order to fully utilize these tests as independent measures of educational outcomes and as adjuncts to student counseling, some knowledge of factors affecting performance which may be relatively independent of educational experience is needed. Such factors investigated in this study were age, sex, full- or part-time attendance, continuous or non-continuous periods of study, and extent of participation in student activities. Other factors which might influence educational experiences and outcomes were also to be compared with GRE performance. These were previous educational (high school rank, previous college training at another institution), senior class (testing period), college or school attended, major field of study, and earning of honors. In addition, the relation between educational outcomes as measured by these tests and outcomes

* A.B. 1951, A.M. 1956, The George Washington University; Ph.D. conferred June 6, 1962. Director of research: James Norman Morsel, *Associate Professor of Psychology*.

as measured by the University (over-all and major grade point averages) were to be investigated. For this purpose an over-all grade point average was computed for each student covering his entire undergraduate period of study at G.W.U., and a major grade point average determined for the portion of course work required by his specialty.

The students studied were seniors in Columbian College and the School of Government from December 1954, to April 1960, who took the Aptitude and Area Tests of the Graduate Record Examination in compliance with the requirement for graduation. Also included were College of General Studies seniors from 1956 through 1960, who were required to take this test.

For the total sample of 2,323 students, Ns, means, and standard deviations were found for each of the five GRE scores for senior class, college, and major. For the purpose of analysis, Columbian College was treated as two colleges, depending upon whether an A.B. or B.S. degree was to be granted. For each of these divisions, tests of significance of the mean difference for each GRE section score were done. For those analyses of variance for which F was significant at or beyond the .05 or .01 level, t-tests were done. On testing date, separate analyses were done including and excluding College of General Studies (C.G.S.) data, as this data did not extend over the same period of time as the data for the other colleges. Thus, mean differences were compared for each of the five tests on twelve testing dates, four colleges, and twenty-one majors. Tests of significance of mean differences were also done for each test for sex.

On the subsample of 1,013 students, tests of significance of mean differences were done for each of the three Area Tests for full- versus part-time students, continuous versus readmitted students, completely G.W.U. trained students versus transfer students, honors versus nonhonors students, and among groups of students with different degrees of activity in campus activities. For each major group, correlations between each of the Area Test scores and the following data were obtained: age, high school rank, amount of advanced standing, extent of participation in activities, over-all grade point average, major grade point average, and intercorrelations among the Area Tests.

Local norms in terms of cumulative percentiles were compiled.

Performance scores on the Area Tests were not independent. Results of this study indicated Social Science (SS) correlated with Humanities (H) .65, SS correlated with Natural Science (NS) .55, and H correlated with NS .55. These intercorrelations were similar to those reported by the Educational Testing Service (ETS) but in general higher than those found by ETS. Correlations of these tests with the Verbal Section of the Aptitude Test as reported by ETS are from .50 to .76, and the results of earlier factor analyses would indicate that much of the shared variance involves a largely verbal or reading comprehension factor.

Analysis of the relationships between individual variables and test scores indicated that in general age was not a significant variable in score interpretation and use, but that sex differences found in other studies were also found here. The very significant ($p<.01$) differences found on each test between mean performance by sex in the group as a whole were however minimized when performance of men and women was compared in the context of the major area of concentration. Results in-

dicated that although men in general are better scorers on Quantitative (Q), SS, and NS and women better scorers on Verbal (V) and H, women who have chosen one of the Q, SS, and NS types of major fields tend to perform about the same as the men. Men who have chosen a verbal or humanities major also tend to perform as well as or better than the women. The actual mean performances of the various groups (regardless of sex) were quite different, so that, if members of specialized groups are compared, sex differences may be quite small, but if members of several such groups are to be compared to the combined group, differences may be large.

Measures of previous educational experience such as high school rank and number of hours of acceptable transfer college credit were not, in most cases, significantly related to Area Test performance. Average correlation between high school rank and SS was .15, H .21, and NS .11. Average correlation of number of hours of transfer credit with SS was .08, with H .10, and with NS .07. Tests of significance between mean differences (t) for transfer versus nontransfer student Area Test performance were not significant.

Analyses using present educational experience variables involved tests of significance of mean differences on all tests for the various colleges and majors. F-tests were significant at beyond the .01 level for all tests for colleges and for majors. The science students excelled the other colleges in the quantitative and scientific areas. (Q means: B.S. 567, A.B. 464, Columbian; A.B. in Govt. 501, Government; and A.B. 543, General Studies). (NS means: B.S. 615, A.B. 476, Columbian; A.B. in Govt. 441, Government; and A.B. 493, General Studies). Both groups of liberal arts college students (A.B. and B.S. Columbian College) were superior to the other colleges on Humanities (means: A.B. 529, B.S. 500, Columbian; A.B. in Govt. 456, Government; and A.B. 459, General Studies) and on Verbal Aptitude (A.B. 545, B.S. 539, Columbian; A.B. in Govt. 502, Government; and A.B. 506, General Studies). For the Social Science test, with the exception of the B.S. students (mean 496) who fell below the other groups, there were no significant differences in mean performance (A.B., Columbian 529; A.B. in Govt., Government 525; and A.B., General Studies 519). These results seem to reflect in part the different objectives of the colleges. Columbian College aims stress liberal arts education, and these students in general tend to perform better on the various tests. Although these A.B. students are highest on three of the five tests, they are below the scaled score mean of 500 on both quantitative and scientific material. The College of General Studies results involved two separate programs, and the students tested are almost entirely military personnel, being assisted in obtaining schooling by the services. Background and experience may be a factor in the higher quantitative and science performance than shown by other A.B. students. The School of Government aims are primarily toward education in the social sciences and performance on this Area Test is equivalent to that of the Columbian A.B. group. On H and NS, performance is decidedly lower and probably reflects the lack of stated requirements in these areas as well as the limited elective program in general.

Within the colleges, by major group, there were also vast differences in performance on the tests. There was a tendency for each major group to do best on its own Area Test, but not to the same extent. Physics students earned highest mean scores on both the Quantitative and the Natural Science tests. The sciences

were consistently best on the Natural Science test; three of the sciences and accounting were high on Q; governmental, economics, and history types of majors did best on the Social Science Area test. On H, however, one of the humanities (English) groups earned the highest mean score, but the three other high groups were social science majors. As a group the humanities majors were the least consistent, with relative performance on the various tests varying widely. Of the major groups, only three science majors (physics, chemistry, and mathematics) had mean scores at or above the 500 mean on all sections of the Graduate Record Examination. One social science, psychology, was above 500 on four of the five tests, scoring 494 on Q. Only one major, speech, a humanities major, failed to exceed a mean score of 500 on any section.

Variations in mean performance over time were found. Changes showed an improvement in performance on H and NS during the last three to four years of the study. With C.G.S. students excluded, no changes were observed on the mathematical and social science sections. One class appeared to be quite superior to the majority of the classes on Verbal performance. Apparently, however, with the exception of this 1959 class, aptitude or general ability was fairly constant over the period.

No significant differences in mean performance were found between full- and part-time students. On H and NS, no significant differences were found between continuously attending students and those who had interrupted and reentered college. On SS, however, a mean difference significant at beyond the .01 level in favor of readmitted students was found. Possibly this is a reflection of the more general nature of the Social Science Area tests, dependent on general knowledge rather than specific course work.

Students who were extensively active in activities differed from both those with no activities and those who participated to a lesser extent. These students, generally the campus leaders, were for the most part significantly better in mean GRE area performance. However, those students with medium participation tended to show poorer performance. Few significant differences with other degrees of participation occurred. Patterns of activities differed somewhat by major, with the majority of students not participating in any manner. For more homogeneous groups (majors), correlations between degree of participation and test scores indicated no significant relation between these variables. Average correlations were between participation and SS −.04, and H .02, and NS .01.

Honor students were significantly better on all parts of the Area Tests than nonhonor students ($p<.01$).

Over-all grade point average (GPA) was more closely related to SS ($r=.33$) and H ($r=.36$) performance than to NS ($r=.20$) performance. Within the majors, over-all GPA varied (from 2.61 for Business to 3.18 for C.G.S.), and so did degree of relationship. Where scores on one or two tests were significantly correlated with grade average, in general the test reflecting the major area was involved. Degree of relationship for SS varied from .16 to .53, for H from .15 to .54, and for NS from −.13 to .54.

Major grade point average correlated .32 with SS, .30 with H, and .21 with NS, being similar to the average correlations for over-all GPA. Within major fields va-

riations in major grades were significantly related to differences in test performance for at least one test for all but five majors. Although there was a tendency for one of the significant relationships to be on the test covering the major area, this was not consistently true. Major grade averages varied from 2.80 (physics) to 3.50 (French). Correlations for major average with SS varied from .05 to .57, for H from .09 to .56, and for NS from —.03 to .49. It was noted that in several instances, the major students earning the lowest average grade points also earned high mean Area Test scores in their areas, or conversely, that some major groups with high major grade point averages earned relatively low Area Test scores in their area of concentration. It would appear that major grade point averages are not directly comparable.

Comparison of the test results for the G.W.U. sample with the ETS basic reference group was made. The reference group is not claimed to be a representative sample of typical college seniors, and use of these standards should be based on the extent to which a college feels the group comparable to its student body. Using the sex norms, it was found that the G.W.U. was decidedly above the reference group on V and SS, and about the same on Q (with the men slightly higher). On H and NS, results of the comparisons differed for men and women. On H, the G.W.U. men were close to the reference group mean score; the G.W.U. women, however, were much higher in mean score than the reference group (536 to 513). On NS, the women were approximately the same, but the G.W.U. men were decidedly lower than the reference group men (489 to 516). For combined groups the reference group averaged 480 as to the G.W.U. average of 488 on Q: reference group averaged 492 on V as opposed to the G.W.U. average of 529: SS average for the reference group was 489, G.W.U. average 525; reference group H average was 494, G.W.U. average 500; and for NS the reference group mean score was 487 as opposed to 477 for G.W.U.

If the G.W.U. were divided into the area of social science, humanities, and natural science majors, the G.W.U. group mean scores are above the reference group majors mean scores on all tests for all major groups, with the exception of the G.W.U. humanities majors on the science Area Test, who are eight points below the reference group humanities majors on this test.

Several problems arise with the establishment of a senior testing program. Among those discussed were the lack of motivation on the part of the students, largely through lack of information on why the requirement exists and because graduation is not dependent on score; the problem of the establishment of a baseline against which to view the results so that some indication of initial ability level in the various groups would be available in comparing performance on the achievement tests; the need for more appropriate norms for similar institutions with which to compare the local senior classes; and the need to consider the test results in the light of the aims and objectives of the various colleges involved.

Recommendations for possible improvements in the present program included more adequate dissemination of information on purposes and results to both the faculty and the student body, continuing evaluation and review of local norms, and development of comparable norms based on similar institutions.

In conclusion, it is clear that area of concentration and college within which

work is taken are important variables having to do with differences in performance on these tests. The various colleges and majors differ in terms of goals and aims, major concentration, elective patterns, and required general education courses. Other variables to be considered in interpreting and using GRE scores, particularly locally, would include sex (unless comparing students with others within a major group), senior class (changes over time), and local measures of evaluation.

The tests themselves are intercorrelated with from 30 to 42 per cent of the variance shared. This would reduce their use for individual differential prediction, but does not appear to be so high as to invalidate them as group measures of outcomes.

Even in the absence of major changes in admission policy and curricular outline, changes in level of performance result over periods of time. In this study, this was particularly true with regard to the humanities (modified curriculum change) and natural science (no stated change) and was apparently not a factor for quantitative and social science results.

Results consistent with area of concentration were found for NS and SS, but not for H. On SS, however, some indication that some type of noneducational factor may be involved in performance (such as general knowledge rather than specialized course work) may be indicated by differences found in favor of readmission over continuous students.

In general, factors which apparently may be minimized in comparing students on the GRE include age, previous college training, high school rank, attendance status, and activities status. Sex differences, which were minimized by comparing students within the same field, were apparent in the total group. Some relation between local indices of evaluation and Social Science and Humanities scores was found, but little relation was found for the group as a whole and the Natural Science test.

A factor for which only limited data was available was some measure of quality of incoming student body. High school rank, not available in all cases, was the only measure used. Comparisons between groups, therefore, was made without a comparison of initial ability level. Future studies will have College Entrance Examination Board data as a control on this factor.

STUDIES OF HEMAGGLUTINATION BY ENTEROVIRUSES

by JEROME KERN*

Some of the biological and physico-chemical properties of enterovirus-associated hemagglutinins were investigated and several of the factors that influence the demonstration of hemagglutination by enteroviruses were elucidated. Prototypic and non-prototypic strains of fifteen hemagglutinating enteroviruses of human origin and three new serotypes were subjected to more detailed study, although representative strains of all known non-hemagglutinating serotypes of human origin were surveyed for hemagglutinative capacity. Hemagglutination by three enteroviruses of non-human origin and by encephalomyocarditis virus was studied for comparative purposes.

Hemagglutinating enteroviruses of human origin could be separated into three groups based upon the maximal hemagglutinin titers obtained when human erythrocytes were allowed to settle at 4 C or 37 C. Hemagglutination was best demonstrated with human red cells, although the erythrocytes of the chimpanzee and of several species of monkeys also were agglutinated by some serotypes.

Higher hemagglutinin titers for only ECHO virus types 13 and 20, Coxsackie A-24 virus and Coxsackie B virus types 1, 3 and 5 were obtained with the erythrocytes of newborn infants (cord cells) than with adult red cells.

The hydrogen ion concentration of the diluent altered the hemagglutinin titers obtained only with ECHO virus types 11, 19, 20 and 21, with Coxsackie B virus types 1, 3 and 5 and with JV-9 and Frater viruses.

Hemagglutination by Frater virus and by ECHO 24 virus was described for the first time. The maximal hemagglutinin titer for Frater virus was obtained in phosphate-buffered saline of pH 5.8 when cord or adult erythrocytes were allowed to sediment at 37 C. For ECHO 24 virus, highest hemagglutinin titers were obtained with cord cells at the same pH and temperature.

Detailed studies of hemagglutination by only Coxsackie B-3 and JV-9 viruses revealed that, with the former virus, complete instead of partial hemagglutination patterns resulted when phosphate-buffered saline of pH 5.8 was used as diluent in place of unbuffered saline. However, the hemagglutinin titer obtained either with cord or adult erythrocytes remained unchanged. With JV-9 virus, it was shown that low pH, and not molarity of the buffer component, was responsible for enhanced hemagglutinating activity.

The addition of calcium but not of magnesium ions to unbuffered saline diluents affected the hemagglutinating activity of only the bovine enterovirus, while replace-

* B.S. 1950, Brooklyn College; M.S. 1953, Ohio State University; Ph.D. conferred June 6, 1962. Director of research: Mary Louise Robbins, *Professor of Microbiology*.

ment of sodium by potassium ions affected only EMC virus hemagglutination.

The complex relationships between the hydrogen ion concentrations of diluents, the temperature at which erythrocytes are allowed to sediment and the sensitivity of human adult and human cord erythrocytes on the one hand, and the maximal hemagglutinin titers obtained with the various enteroviruses on the other, may possibly be explained by the reactions characteristic of protein molecules.

The relationship between the formation of hemagglutinins by six enterovirus serotypes and the progression of the cytopathic effect showed that maximal or near-maximal hemagglutinin titers were obtained prior to that time in viral multiplication when all tissue cells showed signs of infection. A decrease in titer upon prolonged incubation of cultures was somewhat reflected by the sensitivity of the preformed hemagglutinins to 37 C temperature. The deterioration of hemagglutinating activity which was observed at even higher temperatures may be a reflection of protein denaturation processes. The hemagglutinating principle was quite stable at the various cold storage temperatures tested.

Comparable yields of hemagglutinins were obtained with all serotypes in rhesus kidney tissue cultures maintained with Medium 199, Eagle's basal medium and Hanks' balanced salt solution with 0.5% lactalbumin hydrolysate. Inhibition of the growth and hemagglutinin formation of ECHO 20 virus was observed when pooled bovine amniotic fluid was used as maintenance medium, although this medium compared favorably with Medium 199, Eagle's medium and Hanks' salt solution-lactalbumin hydrolysate for hemagglutinin formation by the other viruses tested.

Exposure of tissue culture fluids of several non-hemagglutinating serotypes to ultrasonic vibration did not reveal hemagglutination due to deaggregation and numerical increase in active particles. Concentration by high speed centrifugation increased the initially low hemagglutinin titers of culture fluids of known hemagglutinating serotypes, but no activity could be detected with similarly treated culture fluids of non-hemagglutinating serotypes. Alternate adsorption and elution cycles with human erythrocytes and culture fluids of non-hemagglutinating serotypes failed to indicate the selection of hemagglutinating particles in tissue culture passages of eluates.

STUDIES ON THE ENZYMATIC DECARBOXYLATION OF AROMATIC AMINO ACIDS

by WALTER McKAY LOVENBERG*

The biosynthesis of pharmacologically active amines by enzymatic decarboxylation of the corresponding aromatic amino acids has been investigated in both mammalian tissues and microorganisms. Aromatic *L* amino acid decarboxylase in mammalian tissues has been found to catalyze the decarboxylation of 5 hydroxytrytophan (5HTP), 3, 4, dihydroxyphenylalanine (DOPA), tryptophan, phenylalanine, tyrosine, and histidine. A decarboxylase specific for histidine was also found in mouse mast cell tumors. Streptococcus faecalis was found to possess an enzyme which catalyzed the decarboxylation of tyrosine, DOPA, phenylalanine, and tryptophan.

In order to study the decarboxylation of aromatic amino acids in mammals, rapid, sensitive, and specific assays were developed for each substrate. The decarboxylation reaction was assayed in each case by measuring the rate of amine formation in incubation mixtures containing amino acid, pyridoxal phosphate, buffer, an inhibitor of monoamine oxidase, and the enzyme source. The amines were separated from the parent amino acids by small columns of ion exchange resins, and were determined either fluorometrically or colorimetrically.

Guinea pig kidney was found to have the most decarboxylase activity of any mammalian tissues. The enzyme from this tissue was used for most of the studies and was purified 50 to 100 fold by ammonium sulfate fractionation, adsorption and elution from alumina C γ gel, and chromatography on diethylaminoethyl cellulose columns. Although tryptophan, phenylalanine, tyrosine, and histidine are decarboxylated at considerably slower rates than 5HTP or DOPA, the purification of each activity was nearly identical. Using partially purified enzyme preparations, it was found that the pH optima of all the substrates were about 9 with the exception of DOPA. The pH optimum for DOPA was about 6.8 to 7. This lower pH optimum may be due to the fact that DOPA and its decarboxylation product are unstable at pH values above neutrality.

The Michaelis constants have been determined for each substrate. The relatively high K_m values found for tryptophan, phenylalanine, tyrosine, and histidine indicated that substrate concentrations could not be employed to give maximal rates of reaction under practical assay conditions.

Although earlier work indicated that a divalent metal ion was required for 5HTP decarboxylation by guinea pig kidney, no metal requirement could now be demonstrated when the enzyme was assayed under optimal conditions. Ethylenedi-

* B.S. 1956, M.S. 1958, Rutgers University; Ph.D. conferred June 6, 1962. Director of research: Sidney Udenfriend, *Chief, Laboratory of Clinical Biochemistry, National Heart Institute; Research Consultant in Amino Acid Metabolism, Neurohormones, The Graduate Council.* Co-director of research: Carleton Raymond Treadwell, *Professor of Biochemistry.*

aminetetraacetate was found not to inhibit the enzyme and no stimulation was observed by the addition of $MgCl_2$. A requirement for pyridoxal phosphate as the coenzyme could be demonstrated either by omitting it from the reaction mixture or by adding reagents which react with the carbonyl group.

Another interesting property of this enzyme was that the decarboxylation of the less active substrates, tryptophan, phenylalanine, tyrosine, and histidine was stimulated by the inclusion of benzene in the incubation media. The mechanism of this stimulation, however, remains unexplained.

The various natural substrates were found to competitively inhibit each others decarboxylation providing further evidence supporting the concept of a single enzyme for the decarboxylation of aromatic amino acids. As might be expected, the greatest amount of inhibition was exerted by the substrate which had the lowest K_m. 5HTP.

The decarboxylation of DOPA by mammalian tissues had been shown earlier to be inhibited by α methylDOPA. In the present study, this compound was found to strongly inhibit the decarboxylation of all the natural substrates. Other α methylamino acids such as α methyl 5HTP, α methyl meta tyrosine, and α methyltryptophan also exerted significant inhibition. The addition of pyridoxal phosphate to the incubation media resulted in a partial reversal of the inhibition by the α methylamino acids. This observation would indicate that the α methylamino acids are inhibiting by simply inactivating the coenzyme. While reaction with the coenzyme undoubtedly plays a role in inhibition, a number of observations indicated that interaction of the α methylamino acids with the enzyme is extremely important. Only the *L* isomer of α methylDOPA was found to be an inhibitor of the enzyme whereas both the *D* and *L* isomers would be expected to react with the coenzyme. α MethylDOPA did not inhibit tyrosine decarboxylation in Streptococcus faecalis which also requires pyridoxal phosphate as a coenzyme. Furthermore, kinetic studies indicated that α methylDOPA was acting as a competitive inhibitor which is not surprising since the α methylamino acids were also found to be substrates for the enzyme.

A number of studies were done concerning the specificity of aromatic *L* amino acid decarboxylase. In each case where the *D* and the *L* isomers of the amino acids were available, only the *L* form was found to be reactive. Several of the α methylamino acids were found to be decarboxylated at a rate several hundred times slower than the desmethyl analogue. The finding that α methylamino acids are decarboxylated indicates that the α hydrogen of the amino acid is not necessary for decarboxylation, and is probably not labilized during the decarboxylation of natural amino acids. Almost no decarboxylation of α methylamino acids occurred when pyridoxal phosphate was omitted from the incubation mixture. This finding together with the observation that there was a greater degree of inhibition by α methylamino acids in the absence of pyridoxal phosphate suggested that perhaps pyridoxal phosphate is required for dissociation of α methylDOPA or its decarboxylation product from the enzyme.

No decarboxylation of leucine or serine could be detected by these enzyme preparations, however, kynurenine was found to be decarboxylated nearly as rapidly as histidine under optimal conditions. The occurrence of this reaction provides a

link for a new minor pathway of tryptophan metabolism since the product, kynuramine, has recently been shown to be a good substrate for monoamine oxidase. The aldehyde formed in this oxidation is rapidly condensed to form 4 hydroxyquinoline.

In this study mouse mast cell tumors which contained large amounts of histamine were found to have an enzyme which is specific for the decarboxylation of histidine. Although histidine is also a substrate for aromatic *L* amino acid decarboxylase, the properties of the enzyme in mast cell tumors are considerably different. The pH optimum of this enzyme was found to be about 6.0 and the Michaelis constant about 100 times lower than the enzyme of guinea pig kidney. Histidine decarboxylation in guinea pig kidney is strongly inhibited by α methylamino acids and 5HTP, whereas these amino acids do not affect histidine decarboxylation in the mast cell tumors. A further point of differentiation is the lack of stimulation of histidine decarboxylation by benzene in this tumor tissue. A histidine decarboxylating enzyme was also found in rat stomach resembling the mouse mast cell enzyme. The possible physiologic importance of a specific histidine decarboxylase in mammals has been discussed.

Streptococcus faecalis has also been found to possess an enzyme which like aromatic *L* amino acid decarboxylase will decarboxylate several aromatic amino acids. This enzyme has been partially purified and its properties studied. Substrate competition studies indicated that a single enzyme in these microorganisms is responsible for the decarboxylation of tyrosine, DOPA, phenylalanine, and tryptophan. The specificity of this enzyme, however, is quite different from aromatic *L* amino acid decarboxylase. Tyrosine was found to be the best substrate for the bacterial enzyme while 5HTP and histidine which are substrates for the mammalian enzyme do not appear to be decarboxylated.

INVESTIGATIONS ON THE MECHANISM OF ACTION AND INHIBITION OF MONOAMINE OXIDASE

by THOMAS ELIJAH SMITH*

The mechanism of the deamination of N,N-dimethylamines by monoamine oxidase and the mechanism of inhibition of this enzyme by 1-isonicotinyl-2-isopropylhydrazine (iproniazid) were investigated.

* B.S. 1953, Benedict College; M.S. 1959, The George Washington University; Ph.D. conferred June 6, 1962. Director of research, Sidney Udenfriend, *Chief, Laboratory of Clinical Biochemistry, National Heart Institute; Research Consultant in Amino Acid Metabolism; Neurohormones, The Graduate Council.* Co-director of research, Carleton Raymond Treadwell, *Professor of Biochemistry.*

In preliminary studies with various substrates for this enzyme, it was observed that the aldehyde produced from kynuramine by the action of monoamine oxidase spontaneously condensed to 4-hydroxyquinoline with a spectrum completely different from that of kynuramine. This observation led to the development of a rapid and sensitive spectrophotometric assay for this enzyme depending on the disappearance of kynuramine, and likewise, absorbancy at 360 mu.

The enzyme preparation used in most of these studies was obtained by differential extraction of guinea pig liver mitochondria with digitonin. This procedure gave a ten-fold purified enzyme which was stable to dialysis at pH 6 and 4° for twenty-four hours and was not sedimented by centrifugation at 100,000 times gravity for two hours. Further purification of this preparation could be obtained by chromatography on diethylaminoethyl (DEAE) cellulose columns.

The mechanism proposed for the deamination of amines such as hordenine by monoamine oxidase involves a dehydrogenation of the protonated form of the amines to imino compounds which, in the presence of water, are hydrolyzed to aldehydes and dimethylamine. The metabolism of N,N-dimethylamines was reinvestigated and the possibility that these amines are deaminated by a direct oxygenation involving N-oxides as intermediates was explored.

The purified monoamine oxidase preparation, as has been reported for crude tissue preparations, was found to deaminate the N,N-dimethyl derivatives of amines. The N,N-dimethyl derivatives of tyramine, tryptamine, and benzylamine were found to be oxidized at rates of up to 46 percent of that of the unsubstituted amines. The stoichiometry of the reaction with dimethyltryptamine, as has been shown for hordenine, was found to be one mole of dimethylamine and aldehyde formed for each mole of amine disappearing.

The N-oxides of the amines listed above were found to be metabolized by monoamine oxidase as judged by the following criteria: The metabolism of these compounds was inhibited by several structurally different compounds, hydrazines and nonhydrazines, which are known to inhibit monoamine oxidase activity. Tyramine, a substrate of monoamine oxidase, also inhibited the metabolism of the N-oxides, presumably, by competition. Isoniazid and cyanide, which do not inhibit monoamine oxidase activity, were both ineffective. The ratios of the rates of deamination of dimethyltryptamine and its N-oxide were found to be the same in different enzyme preparations with different protein concentrations and enzyme activities. The rate of deamination of N,N-dimethyltryptamine-N-oxide was found to be dependent on both enzyme concentration and on N-oxide concentration.

The slow rate of metabolism of the N-oxide did not permit an evaluation of the stoichiometry of the reaction, however, an aldehyde and dimethylamine appeared to be formed. When aldehyde dehydrogenase was denatured by heating or when oxidized diphosophopyridine nucleotide (DPN) was omitted, the formation of indoleacetic acid from N,N-dimethyltryptamine was almost completely abolished. The 2,4-dinitrophenyl derivative of the small amount of volatile amine formed had spectrophotometric characteristics similar to that of dimethylamine.

When the N-oxides were incubated under anaerobiosis, in direct contrast to other substrates for monoamine oxidase, they were found to be metabolized at a faster rate than in air. A more careful evaluation of the metabolism of these N-

oxides revealed that small amounts of oxygen are required for maximum activity. This amount of oxygen was found to be approximately 0.1 percent. The metabolism of the N-oxides was shown to be inhibited by monoamine oxidase inhibitors under anaerobic conditions as well as under aerobic conditions. The above mentioned characteristics, which were observed for the metabolism of the N-oxides by guinea pig liver preparations, were found to be true for monoamine oxidase prepared from other sources.

The deamination reaction was investigated further by the use of isotopes. When tryptamine and N,N-dimethyltryptamine were incubated in H_2O^{18} with monoamine oxidase, aldehyde dehydrogenase, and DPN, two equivalents of O^{18} were incorporated from water into the indoleacetic acid formed. Control experiments with indoleacetaldehyde, aldehyde dehydrogenase, and DPN, and with tryptophan and *L*-amino acid oxidase showed that about one equivalent of O^{18} from water was incorporated into the final product, indoleacetic acid for the former reaction and indolepyruvic acid for the latter reaction. These experiments indicate that the oxygen in the aldehyde formed from the action of monoamine oxidase on amines, as with *L*-amino acid oxidase, is derived from water. If N-oxides were intermediates in this reaction, in contrast to the observed data, the oxygen in the initial step would have been expected to come from molecular oxygen.

More direct evidence indicating that N-oxides are not intermediates in the deamination of N,N-dimethylamines by monoamine oxidase was obtained by the use of tritium labeled N,N-dimethyltryptamine. Incubation of the labeled N,N-dimethyltryptamine with monoamine oxidase and non-labeled N,N-dimethyltryptamine-N-oxide as carrier did not result in the incorporation of label into the N-oxide, thus, indicating that no free N-oxide was formed and that these compounds are not free intermediates in the deamination of N,N-dimethylamines by monoamine oxidase.

It is proposed instead, that the deamination of these amines occurs by removal of a hydride ion, or its equivalent, from the alpha carbon atom (or alternately, a hydrogen atom from this carbon atom and an electron from the nitrogen) resulting in an imino compound which is hydrolyzed to an aldehyde and an amine.

In an attempt to gain more information on the dehydrogenation process, the reduction of several artificial electron acceptors was tested in the monoamine oxidase system. Of these compounds, cytochrome c, phenazine methosulfate, potassium ferricyanide, phenolindophenol, and methylene blue were not reduced when any substrate was used. Tetrazolium blue, nitrobluetetrazolium, triphenyltetrazolium chloride, bromophenolindophenol, and 2,6-dichlorophenolindophenol were found to be reduced when tryptamine was the substrate. The nitrobluetetrazolium and 2,6-dichlorophenolindophenol were reduced when tyramine was the substrate. The observations, however, that the reduction of these compounds was inhibited by high concentrations of semicarbazide, but the oxidation of the amines was not affected, and that these acceptors were not reduced when kynuramine or isoamylamine was the substrate, indicated that the observed reduction was not directly due to monoamine oxidase, but to further (non-enzymatic) oxidation of the aldehyde produced by the action of monoamine oxidase on the amine substrates.

Monoamine oxidase activity was found to be partially inhibited by metal chelating agents such as 8-hydroxyquinoline, o-phenanthroline, 2,2′-dipyridyl, and diethyl-

dithiocarbamate, indicating that a metal may be involved in the reaction. Dialysis of the enzyme against 8-hydroxyquinoline at pH 6, 7, and 8 against 2,2′-dipyridyl, however, did not result in a metal requirement for enzyme activity.

Studies were conducted on the mechanism of inhibition of monoamine oxidase by 1-isonicotinyl-2-(2-C^{14}-isopropyl)hydrazine (iproniazid). This compound was shown to be cleaved to both acetone and isopropylhydrazine. The cleavage of the iproniazid molecule was found to require oxygen and to be accelerated in the presence of cyanide. The suggestion has been advanced that free isopropylhydrazine is the active inhibitor of monoamine oxidase and that the required preincubation of this compound with monoamine oxidase in oxygen is necessary to convert (non-enzymatically) iproniazid to isopropylhydrazine.

The stability of the iproniazid-monoamine oxidase complex and the specificity of the binding of iproniazid to this enzyme allowed an estimation of the ratio of catalytic sites to enzyme activity. From this data, the turnover rate was estimated to be 172 moles per minute per mole equivalent of enzyme for kynuramine as substrate at 37° and at pH 8. A more exact turnover rate, as with other properties of this enzyme, must await further purification of the enzyme or the use of an inhibitor molecule containing more radioactivity and one that is more stable than iproniazid.

SUMMARIES OF DISSERTATIONS
SUBMITTED FOR THE
DEGREE OF DOCTOR OF JURIDICAL SCIENCE

THE EVOLUTION OF FIRST AMENDMENT DOCTRINES IN THE SUPREME COURT: AN HISTORICAL STUDY OF CASES ON FREEDOM OF EXPRESSION

by EDWARD GERARD HUDON*

In 1921, during the course of a lecture on "The Nature of the Judicial Process", Benjamin Nathan Cardozo, then a member of the Court of Appeals of the State of New York, spoke as follows:

> The great generalities of the Constitution have a content and a significance that vary from age to age.[1]

He could, however, very well have extended his statement to some of the specific—particularly to the prohibition of the First Amendment concerning speech and press. Couched though this is in terms that are anything but general, its meaning has varied from age to age and even from decade to decade. The Amendment was adopted to end uncertainty, yet from the beginning the meaning of the words "Congress shall make no law . . . abridging the freedom of speech or of the press" has followed a vacillating course that has led now to one theory and then to another.

As it was presented to the states for adoption, the Constitution contained no bill of rights which expressly set forth and enumerated rights that were generally considered "natural". Widespread objection followed that even threatened its rejection, and this persisted even though there was reassurance by some of the leaders of the Constitutional Convention that the Constitution itself was a bill of rights. To allay the fears of the people at large, the First Ten Amendments to the Constitution were adopted by the First Congress and ratified by the states. In these, the means were set forth to fulfill the Natural Rights tradition of the Declaration of Independence and its doctrine of "unalienable rights".

The First of the Ten Amendments, the prohibition as to speech and press, was the result of bitter memories of the English law of speech and press under which the Colonists had lived and against which they had rebelled. Based as this law was on theories of law and sovereignty that treated the authority of government as supreme, irresistible, and absolute, it considered any criticism of the government and of its officials as a danger that had to be suppressed by every possible means and with the least possible delay. The theory of the First Amendment was to expressly reject all of this and to assure that it would not survive in this country.

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* B.S. 1937, Bowdoin College; LL.B. 1947, LL.M. 1950, Georgetown University; M.S. in L.S. 1956, Catholic University of America; S.J.D. conferred February 22, 1962. Professor in charge of research: Robert Galloway Dixon, Jr., *Professor of Law*.

[1] Cardozo, *The Nature of the Judicial Process*. *See* Hall, editor, *Selected Writings of Benjamin Nathan Cardozo* (1947), p. 111.

The faith of the Founding Fathers was deep rooted enough in Natural Rights, the secularized doctrine of Natural Law which had been fundamental to the struggle against arbitrary government, that it survived in this country long after it had been set to one side in Europe. It served as the basis for the American system of judicial review and as the principle with which to interpret the ambiguities of the Fourteenth Amendment. Its omnipresence can be felt even today not only as it continues to serve as the basis for declarations of rights in the constitutions of new states as they enter the union,[2] but also as present-day presidents refer to our government as one "based upon liberty and the God-given rights of man" [3] and reaffirm "the belief that the rights of man come not from the generosity of the state, but from the hand of God." [4] But however much that may be true, and although Natural Law and Natural Rights served as the basis for the Constitution and the Bill of Rights, this did not long survive in the area of speech and press. Less than ten years after the First Congress had done its work, the Alien and Sedition Acts became law.[5] The acts themselves and the trials that took place under them represented an attempt to return to the old English common law with its theories of law and sovereignty. Again it was fear of adverse criticism by those in power, as it had been earlier in England, that engendered a desire to protect those in authority from the supposed evil effects of this criticism. Once more resentment was immediate, the Kentucky and Virginia Resolutions were written by Madison and Jefferson, and the latter was provided with an issue for the election of 1800.

In our own century, the twentieth, there has been an ever increasing number of speech and press cases since the prohibition of the First Amendment was extended to the states through the Fourteenth. This has meant continued experimentation with the law of speech and press as the quest for its true meaning goes on and one theory follows another. The first of these theories was "use-abuse" or "liberty versus license" which represented an attempt to draw a sharp line between speech and press that was considered right and speech and press that was considered wrong. The idea was to place liberty on one side and licentiousness or abuse on the other. This theory served in the World War I Espionage Act cases which were concerned either with pamphlets or foreign and English-language newspapers that were critical of the war effort. The same theory served in the State Criminal Syndicalism Act cases of the 1920's.

But even as "use-abuse" or "liberty versus license" held sway, Mr. Justice Holmes' celebrated "clear and present danger" test was being developed. Although this first gained exposition in an opinion for a unanimous Court, it was in the minority and concurring opinions of Justices Holmes and Brandeis in the Espionage Act and the State Criminal Syndicalism Act cases that it took shape and was made ready for a later date. However, before this later date could come to pass there was to be an interval of obscurity, and even of eclipse, for the test. This interval was the

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[2] See the Constitution of the State of Alaska agreed to by the Delegates of the People of Alaska, February 5, 1956.

[3] President Dwight D. Eisenhower, Annual Message on the State of the Union, January 9, 1959. See House Document No. 1, 86th Congress, 1st Session. See also, 105 *Congressional Record* 359, 362

[4] President John F. Kennedy, Inaugural Address, January 20, 1961, 107 *Congressional Record* 970 (1961) [daily pagination].

[5] 1 Statutes at Large 566, 570, 596 (1798).

period from 1930 to 1940 when Charles Evans Hughes presided over the Court as Chief Justice. The major contribution of this era to the law of speech and press was to revitalize the old English concept of "prior restraint" and make a "trump card" of it that has served the Court well ever since when nothing else has seemed applicable.

The decade from 1940 to 1950 was the decade of "clear and present danger" during which civil liberties were said to occupy a "preferred position". The test that Holmes and Brandeis had used only in cases involving national security was now extended to picketing as this became a legitimate form of expression, to municipal ordinances and statutes designed to regulate the activities of Jehovah's Witnesses, to contempt of court cases, both state and federal, arising from out-of-court publications concerning pending cases, and even to enforce the right of an individual to make a provocative, challenging speech in an atmosphere of turbulence, disorder, and animosity. But even as this took place there was one voice that was consistent in dissent. In case after case Mr. Justice Frankfurter objected to what he believed to be a misconception of the origin and the purpose of "clear and present danger". He insisted that it "was a literary phrase not to be distorted by being taken from its context",[6] and that Mr. Justice Holmes had never used it "to express a technical legal doctrine or to convey a formula for adjudicating cases." [7] Soon, with a change in the personnel of the Court and the advent of another decade Mr. Justice Frankfurter was destined to have his way.

By 1950 there were indications that "clear and present danger" was about to go the way of its predecessors. As the Court upheld the non-Communist affidavit requirement of the Labor-Management Relations Act it commented on the inappropriateness of the test as a mechanical one to be used in every First Amendment case.[8] One year later the Court made its most recent pronouncement in terms of the test in *Dennis* v. *United States* [9] when it upheld the convictions of the top Communists in this country. A majority was nowhere to be found that would agree on an opinion that could be considered the opinion of the Court. Although seven of the eight Justices who participated in the case subscribed to "clear and present danger" in principle, only six thought that even in principle it should be applied here, and of the six no more than four were with the majority. These four were together in a plurality opinion that reshaped the test and substituted "gravity of the 'evil,' discounted by its improbability" [10] for the traditional view of immediacy. The other two dissented in terms of the traditional Holmes-Brandeis exposition. It was now evident that the test could no longer serve as a rule of decision.

Since *Dennis*, the Court has entertained very much the same type of cases that it did during the prior decade—picketing, municipal ordinance, and soliciting cases; Jehovah's Witness, censorship, and Smith Act cases—in all of which "clear and present danger" had played so prominent a part earlier. However, the historic test

[6] *Pennekamp* v. *Florida*, 328 U. S. 331, 353 (1946).
[7] *Ibid.*
[8] *American Communications Ass'n* v. *Douds*, 339 U. S. 382, 394 (1950).
[9] 341 U. S. 494 (1951).
[10] See Judge Hand's original exposition of this in *United States* v. *Dennis*, 183 F. 2d 201, 212 (C.A. 2, 1950).

has not been heard of except to be expressly rejected as not worthy of consideration when an attempt was made to apply it to libelous utterances and obscenity. "Previous restraint" has been used on a few occasions, but not to the extent that it can be said to have become a prevailing doctrine, and there are indications that even this time-worn doctrine may be in the process of being supplanted by a new idea of "balancing of interests", public versus private, as the Court again emerges from one decade to another. But although the history of this new idea is short, it has already encountered formidable opposition and its future is uncertain. Furthermore, there appears to be a trend to "tone down" First Amendment issues and even to set them to one side, if need be, to muster a majority and reach a decision. One interesting development that started by way of dicta in 1957 has been an attempt to proclaim a kinship at both the state and federal levels between First Amendment prohibitions (applied to the states through the Fourteenth) and the power of the legislative body to investigate. But by 1961 this had been reduced to no more than a "threat" as the Court has appeared to have drawn away from and distinguished its earlier pronouncement.

Thus, from the beginning the story of the law of speech and press has, in this country, been one of vacillation. To a considerable extent, this has been due to the lack of a basic philosophy to serve as a stabilizing influence in the interpretation of the First Amendment. The premise is that this has not been caused by ". . . insufficient data by which to determine the interests entitled to protection under it," [11] but by a neglect of the data that is at hand—by a neglect of the Natural Law environment from which both the Constitution and the Amendment arose. And this has been true even though a Natural Law process served to incorporate the First Amendment into the Fourteenth, along with several of the other original Ten Amendments that comprise the Bill of Rights. On occasion, this neglect has been an express rejection as when Mr. Justice Black bluntly declared in a Fifth Amendment case that an earlier decision and the Natural Law theory of the Constitution upon which it relied "degrade[d] the Constitutional safeguards of the Bill of Rights . . ." [12] It has also been on a more scholarly and restrained basis as when Judge Learned Hand assumed *arguendo* "that the Constitution and the 'Bill of Rights' neither proceed from, nor have any warrant in, the Divine Will, either as St. Thomas or Jefferson believed." [13]

No one can dispute that "there is no agreement as to the standards by which to measure the scope of the first amendment." [14] None of the tests that have prevailed at different periods in the history of the Amendment has outlasted a decade. It has also been asserted that the several tests are not as different from one another as they appear to be on the surface—that the difference between "liberty versus license", "clear and present danger", and the current "balancing of interests" test is more semantical than real and that they all involve some sort of "balancing".

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[11] Nutting, "Is the First Amendment Obsolete?" 30 *The George Washington Law Review* 167, 171 (1961).

[12] *Adamson* v. *California*, 332 U. S. 46, 70 (1947).

[13] Hand, *The Bill of Rights* (Harvard, The Oliver Wendell Holmes Lectures, 1958), p. 2.

[14] Nutting, p. 171.

This has been said even of such widely separated views as Mr. Justice Holmes' "fire in a crowded theatre" [15] statement and Mr. Justice Black's application of his "plain-language-complete-incorporation" doctrine.[16] But even if this is admitted for the sake of argument, the different tests have nevertheless varied considerably in the amount of freedom that has been permitted under each and in their degree of flexibility.

"Liberty versus license" was quite inflexible and restrictive of speech and press while it held sway, and that eventually caused its downfall. "Clear and present danger" was more flexible, and while it prevailed the conduct of individuals could generally be fitted within its framework if the interest to be protected was private. In most of the cases in which this was done, the question was whether an individual or a group should go to jail for committing some minor offense as violating a state anti-picketing law, accosting a person on the street, and playing a phonograph record that attacked this person's religious faith, school children refusing to salute the flag as required by state law, publishing editorials or cartoons that offended judges, some of whom were perhaps oversensitive, soliciting in areas where soliciting was not particularly welcome, or even insisting on the right to address a hostile audience in a manner that was both offensive and in bad taste. In these cases the issues were of great concern to the individuals or the groups—no one particularly wants to spend time in jail—but in none was there any great national interest present. "Clear and present danger" served as a good measure with which to assess the effect of the conduct of these individuals, many of whom acted in good faith and got into trouble either because their religious beliefs differed from those of the majority, because they suffered from some supposed or actual wrong, or because they encountered some overzealous local law enforcement officer. Fortunately, a liberal application of the tests as it was then phrased kept most of these people out of jail. However, when it became a question of the amount of leeway to be permitted one whose primary interest was to promote the interests of world communism, especially in a time of crisis as in 1951, "clear and present danger" broke down. This became evident when no more than a plurality of four of a majority of six would take a chance on it even if it was rephrased to substitute "probability" for "remoteness".

"Balancing of interests" toward which the Court had started to veer even before "clear and present danger" passed from the scene, has been described by Mr. Justice Douglas as rendering the commands of the First Amendment as "no more than admonitions of moderation".[17] Mr. Justice Black has been no less adamant in his criticism of what he has described as "the freedom-destroying nature" of this current test.[18] Its flexibility is such that it reduces speech and press to the level of every other interest and it is made to compete with these on equal terms. Moreover, it has a tendency to tip the scales against the individual—particularly in con-

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[15] *Schenck* v. *United States*, 249 U. S. 47, 52 (1919).

[16] Nutting, p. 172.

[17] *Scales* v. *United States*, 367 U. S. 203, 270, 271 (1961). See Professor Robert G. Dixon, Jr.'s, comment that Justices Black and Douglas' absolutist approach to First Amendment issues "reflects a feeling that these freedoms are too intrinsic to democracy to be subjected to the erosion of plausible exceptions." 9 *Journal of Public Law* 214, 220 (1960).

[18] *Scales* v. *United States*, 367 U. S. 203, 259, 261 (1961).

tempt of Congress cases when the Court balances "the security of the nation against the freedom of the individual litigant".[19] "Balancing" recognizes no limits except its own self-restraint; it can stop anywhere or nowhere at all. As a result, a "right" originally intended to secure that even a minority should have the privilege of making itself heard becomes no more than a "permission". Whether this "right" is granted or denied is now made to depend on he who controls the "balance".[20]

To date, the "balancing" test has never commanded the support of more than five of the nine members of the Court with one, Mr. Justice Stewart, acting as the "swing" man. Its status is, to say the least, quite precarious. The first change in the composition of the Court could spell its doom. In fact, it was set to one side in a 1961 contempt of Congress case.[21] Justice Stewart deserted the "balancers" and joined those who oppose "balancing" to form a new majority which appears to resolve its differences by "toning down" First Amendment issues whenever possible and by treating them as questions of evidence. This "toning down" process may be gaining favor. Evidence of this appears in *Garner* v. *Louisiana*, decided December 11, 1961,[22] a "sit-in" case in which the petitioners, all arrested because they insisted on being served contrary to a segregation policy at a lunch counter, raised First and Fourteenth Amendment objections. Rather than decide the case on constitutional grounds, the Court chose to base its decision on whether the convictions rested on evidence "which would support a finding that the petitioners' acts caused a disturbance of the peace."[23] The decision to reverse was unanimous with three judges concurring.

It might be that even the secularized version of the Natural Law that Jefferson and the others believed in could not provide the answer. It could, however, provide a stabilizing influence and place the First and the other amendments that comprise the Bill of Rights in their proper setting and environment. For this, one need not necessarily subscribe to this eighteenth century doctrine any more than one need approve of the contents of legislative materials that are now so often searched to find Congressional intent. In either instance, the objective is to find the meaning of words. In the case of the First Amendment, its authors had something very definite in mind when they chose absolute terms to assure the rights of speech and press. While in the broad sense these rights must be admitted to be qualified, in the narrow sense they must encompass an area in which they were intended to be absolute. To discover the limits of this area one must consult the only data available—that which surrounded and motivated the adoption of the rights.

As the data that is available is examined, whether or not St. Thomas, the other doctors and fathers of the Church, and even Suarez, are included as a part of the

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[19] Chief Justice Earl Warren, 1962 James Madison Lecture delivered at The New York University Law Center, February 1, 1962.

[20] For different views on the "balancing" test see the following: Meiklejohn, "The First Amendment is an Absolute," 1961 *The Supreme Court Review* 245; Charles L. Black, Jr., "Mr. Justice Black, the Supreme Court, and the Bill of Rights," *Harpers*, February, 1961, p. 63; Nutting, "Is the First Amendment Obsolete?" 30 *The George Washington Law Review* 167 (1961); "The Supreme Court, 1960 Term," 75 *Harvard Law Review* 40, 116 (1961).

[21] *Deutch* v. *United States*, 367 U. S. 456 (1961)

[22] 368 U. S. 157 (1961).

[23] *Ibid.*, pp. 163, 164.

line of development that extended from Zeno to Locke depends very much on the religious preference of the individual, or the lack of one, and even on environment. But whatever the position may be that is assumed in this respect, a decision for or against the early philosophers of the Church is really not as crucial as it might at first appear to be. Even among the colonists themselves opinion was anything but unanimous as to the source of the higher law that they all invoked.[24] There were those like James Otis who thought that the law of Nature was the "unchangeable will of God, the author of nature, whose laws never vary"; [25] and along with these there were the revolutionary preachers who expounded from the pulpit that government was "both the ordinance of God, and the ordinance of man: of God, in respect to his original plan, and universal providence; of man, as it is immediately the result of human prudence, wisdom concert." [26] There were also the others like John Adams and Jefferson who, while they admitted that God or a god had set things in motion, nevertheless preferred the secular doctrine of Cicero and Grotius that depended on reason rather than revelation to keep things going once they had started. But, it must be remembered, Grotius had borrowed heavily from the Scholastics and he acknowledged this debt by paying homage to the Vittoria, Suarez, and others.[27] It must also be noted that Adams, Jefferson, and the others always were careful to include a reference to God in their scheme of things as they straddled and invoked both God and nature. But whatever either group might consider as the source of Natural Law and Natural Rights, they all subscribed to certain basic rules of human behavior capable, it was said, of being discovered through reason, experience, and revelation. These rules were the same as Justinian's "immutable laws of good and evil" that the colonists restated as the Golden Rule that we know today. The objective was life, liberty, and the pursuit of happiness with an emphasis on property. Positive law, that which man subjected himself to when he abandoned his idyllic state of nature in his search for society, had to conform to this inherited sense of right and wrong or be considered unnatural and not law at all.

However indefinite or vague this may seem today, it served both as a fighting faith for a successful revolution against arbitrary government and as the basis for a new experiment in government that sought to assure the rights of the individual. As it did the latter it set out areas with, it was assumed, well defined limits within which these rights that were considered "natural" and "inalienable" could not be interfered with. In so far as we are concerned today, what these limits are depends on the criterion applied: St. Thomas' admonition that man has a right to live as a human person, to perfect his moral nature, and live as a free and intelligent individual; Justinian's "immutable laws of good and evil"; the Golden Rule; or

[24] For a discussion of this see Rossiter, *Seedtime of the Republic* (1953), p. 366 *et seq.*

[25] Otis, *The Rights of the British Colonies Asserted and Proved* (1765), p. 8.

[26] Jonathan Mayhew, "A Sermon Preached in the Audience of His Excellency William Shirley, Esq., May 29, 1754." See also a sermon preached by the Reverend Samuel Quincy in which he maintained that the knowledge of God by light and nature taught that God "has endowed us with Reason and Understanding (Faculties which Brutes have not) on purpose to contemplate his Beauty and Glory, and to keep our inferior Appetites in due Subjection to his Laws, written in our Hearts." Twenty Sermons Preached in the Parish of St Philips Church, *Charleston, S. C.*, (1750), pp. 59, 60.

[27] See Roman, The Natural Law (1949), p. 73, d-Entreves, *Natural Law* (1951), pp. 50, 51. See also, Pound, *Law and Morals* (1926), pp. 8, 9.

simply life, liberty, and the pursuit of happiness. In final analysis, they all resemble one another since they are all concerned with the welfare of the individual. More significant than their contents is the idea that their authors intended to set up areas within the limits of which rights were considered absolute and beyond the power of the state. As to speech and press, it is only in the definition of areas that the absolutes of the Natural Law approach differs from the absolutist ideas of Justices Black and Douglas, particularly the former. In the 1960 James Madison Lecture that he delivered at the New York University Law Center Justice Black restated his belief ". . . that one of the primary purposes of the Constitution with its amendments was to withdraw from the Government *all* power to act in certain areas—*whatever the scope of these areas may be.*" [28] He left the "scope," i.e., the limits, of the areas uncertain and it is this uncertainty that has been used to accuse him of some sort of "balancing" without which, his accusers say, he could not put his doctrine into practice.[29]

As a practical matter, it is perhaps inevitable that the meaning of liberty of speech and press should change from one point to another in the manner of a pendulum which, to quote Mr. Justice Cardozo out of context, "has swung back and forth a good many times." [30] That is the unavoidable path that the collective opinion of a panel of nine men must follow as its composition varies and as it meets diverse situations. There is no danger so long as the pendulum remains suspended from a fixed point and the movement of the prohibition of the First Amendment as to speech and press is regulated by the criteria that surrounded its adoption. There is danger if the pendulum is detached from its fixed point, the Natural Law criteria that motivated the adoption of the First Amendment are ignored, and the meaning of liberty of speech and press is permitted to depend on the whims of the majority to the detriment of the minority whose rights it was intended to protect. There is also danger if the law of speech and press is artificially frozen in an inflexible position as it was for so long from the early law of seditious libel in England until even after the adoption of the First Amendment in this country.

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[28] 35 *New York University Law Review* 865, 874, 875 (1960) [emphasis added].

[29] Nutting, p. 173. See also, Charles L. Black, Jr., "Mr. Justice Black, the Supreme Court, and the Bill of Rights," *Harpers*, February, 1961, pp. 63, 65; Mendelson, *Justices Black and Frankfurter: Conflict in the Court* (1961). The entire tenor of Professor Mendelson's book appears to be an indictment of Mr. Justice Black and a glorification of Mr. Justice Frankfurter. One should not read the book without also reading James Clayton's book review of it that appeared in *The Washington Post* for January 15, 1961. Mr. Clayton not only makes the point that the treatment accorded Mr. Justice Black's judicial philosophy is lopsided and unfair while Mr. Justice Frankfurter's philosophy is depicted as so perfect that no one should question it but he also asserts that it might have been worthwhile for the publisher to make the reader aware of the fact that Mr. Mendelson once worked for Mr. Justice Frankfurter in Washington. He could have noted this, wrote Mr. Clayton, in the descriptive material about Mendelson. For a different type review of the book see that by Professor Dixon, 30 *Fordham Law Review* 214 (1961), in which Professor Mendelson's reaction is said to be "both sharp and profound" and the result "a powerful work."

[30] See Hall, editor, *Selected Writings of Benjamin Nathan Cardozo* (1947), p. 200.

NATO "FAIR TRIAL" SAFEGUARDS: PRECURSOR TO AN INTERNATIONAL BILL OF PROCEDURAL RIGHTS

by ROBERT B. ELLERT*

World War II and its aftermath demonstrated the futility of planning military defense in terms of an individual country. The Western world needed a new approach to preserve its security. In March 1946 Winston Churchill in a speech at Fulton, Missouri, made a proposal for a defensive alliance to protect the West in the cold war.

In succeeding years the United States recognized the necessity for such a defensive alliance and that the survival of the United States and of the other free nations of the North Atlantic Community depended on collective security. Truly, as was stated by Secretary of State Dulles, independence today could only be achieved by interdependence.

On April 4, 1949, the desire of the United States, Canada, Belgium, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, and the United Kingdom to share the problem of mutual defense was formalized by the North Atlantic Treaty. In 1952 Greece and Turkey joined NATO and in 1955 so did the Federal Republic of Germany. This agreement was a partnership of politically free and economically stable nations joined together for the purpose of exercising those political, economic, and military sanctions necessary to defend against communist aggression and expansion.

This all important defensive alliance contemplated an unprecedented peacetime stationing of the forces of one party in the territory of another. What, however, was to be the status of such visiting forces? Decision makers could not justify to their peoples the need for according to visiting forces in peacetime the sweeping immunities from local law which were granted to them *in extremis* during World War II. Yet, the forces of a sending state, even in peacetime, needed certain functional immunities from local law in order to properly carry out the mutual defense requirements of NATO. Consequently, it was necessary to negotiate a balanced agreement based upon reciprocity which more or less precisely defined the rights, duties, and obligations of a visiting force while stationed in the host state.

On June 19, 1951, the *Agreement Between the Parties to the North Atlantic Treaty Regarding the Status of their Forces* was signed in London and eventually ratified by 13 nations. This agreement sets out the rights, obligations, and duties of the signatories in several areas of importance, including such matters as pass-

* A.B. 1947, B.C.L. 1949, College of William and Mary; Postgraduate Diploma in Law 1956, Kings College, University of London, England, S.J.D. conferred June 6, 1962. Professor in charge of research: William Thomas Mallison, Jr., *Professor of Law*.

port and visa regulations; identity cards, movement orders, and expulsion of undesirables; drivers licenses; procurement of goods, services, facilities, and labor: criminal jurisdiction; duty free imports; and foreign exchange regulations.

The criminal jurisdictional provision is the heart of the agreement. It is an integral segment of the give and take scheme of mutual defense which is the keystone of NATO. This provision sets out a formula which resolves the sensitive issue of the exercise of criminal jurisdiction over members of a force who commit offenses in the host country over which there is concurrent jurisdiction by the sending and receiving states.

The agreement also balances the interests of the signatories by providing that a member of a visiting force is entitled to certain "fair trial" safeguards when prosecuted by a receiving state. This provision insures that a member of a visiting force will have the right to certain minimum procedural safeguards even though tried by a receiving state whose system of law might be different from that of a sending state. These safeguards are set out in paragraph 9 of Article VII, NATO SOF Agreement, as follows:

1. To a prompt and speedy trial
2. To be informed, in advance of trial, of the specific charge or charges made against him
3. To be confronted with the witnesses against him
4. To have compulsory process for obtaining witnesses in his favour, if they are within the jurisdiction of the receiving state
5. To have legal representation of his own choice for his defense or to have free or assisted legal representation under the conditions prevailing for the time being in the receiving state
6. If he considers it necessary, to have the services of a competent interpreter
7. To communicate with a representative of the government of the sending state and, when the rules of the court permit, to have such a representative present at his trial

Based on the precedent of the NATO SOF Agreement these procedural safeguards were also incorporated into bilateral status of forces agreements between the United States and Japan, Pakistan, Nicaragua, Libya, Iceland, the West Indies, and Australia (Nauru Islands).

The inclusion of these "fair trial" safeguards in the NATO and other SOF agreements and their day-to-day application in different legal systems in literally thousands of cases each year represents a unique breakthrough in the implementation of human rights. It has been because of a lack of such implementation that the purpose of the United Nations, as set out in the Universal Declaration of Human Rights, with regard to the promotion and observance of human rights has been largely unfulfilled. Besides numerous political points which have created areas of disagreement among nations, such as the right of petition by individuals, the preparation of a Bill of Rights converting the Declaration of Human Rights into a body of binding obligations has been complicated by the fact that the concepts underlying basic civil liberties and safeguards are so general in character that they are subject to diverse interpretations, not just in the different major legal systems but also in different states belonging to the same major legal system.

The main purpose of this inquiry is to suggest an informal approach whereby the extensive practice of the United States, the NATO nations, and other nations during the past eight years in the implementation of the "fair trial" safeguards contained in the various status of forces agreements in different systems of law may be utilized to achieve in one small area of individual rights where there is disagreement among nations an orderly modification of international law which would lead ultimately to universal acceptance of such rights in an international Bill of Procedural Rights.

The area chosen comprises the minimum procedural safeguards to be accorded an alien prosecuted by a host country. It will be demonstrated that there is a definite dichotomy between two groups of nations as to the criteria to be applied in determining the minimum procedural safeguards which a state must accord in the prosecution of an alien in order to avoid international responsibility for a denial thereof.

A subordinate purpose of this inquiry is to consider the remedies a United States serviceman would have under international law and United States domestic law in the event he were denied one of the "fair trial" safeguards set out in paragraph 9 of Article VII of the NATO SOF Agreement.

The method of inquiry will be largely empirical. It will emphasize the development of international law as a decision making process in which the decision makers of the various nations are influenced by many variables; as a flow of decisions in which community prescriptions are formulated, invoked, and in fact applied in the promotion of community policies. In assessing the validity of legal doctrines not only the structures and processes of formal authority but also those of effective power and of their interrelations will be considered. Specifically, the practice of the United States and other nations during the past eight years in the implementation of the NATO "fair trial" safeguards in the several thousand cases involving United States servicemen will be studied and evaluated in the context of how such practice may have been influenced by the mutual defense goal of the countries concerned.

In Chapter II, *Minimum Procedural Safeguards and Customary International Law*, the existing practice of states was examined in order to determine whether or not there is a rule of customary international law which prescribes the procedural safeguards to which an alien is entitled if prosecuted by a host state.

Conflicting community goals and aspirations on the part of weak and strong states resulted in the decision makers of such states espousing two divergent theories regarding the standard of the procedural safeguards which a host country must accord in the prosecution of an alien. On the one hand, the less developed and weaker states, whose legal systems fell below the norms of the more sophisticated and stronger states, insisted that an alien was entitled only to the procedural safeguards accorded by the domestic law of the host state to its own nationals. These states resented and regarded as unwarranted interference the contention of the more developed and stronger states that their nationals engaged in commerce abroad were entitled, when prosecuted by a host state, to the procedural safeguards set out in a universal minimum standard of justice for all aliens. These theories are known respectively as the "national treatment" theory and the "minimum standard" theory.

Each theory is now supported by a substantial body of "policy oriented" legal doctrines and rules.

An examination of this large body of legal doctrine and rules discloses a substantial number of states and prominent publicists adhering to each theory.

In view of this dichotomy, it cannot be said that there is evidence of a constant and uniform practice upon which could be predicated the positive requirements of a rule of customary international law. The most that can be claimed from the practice of states on this subject is that there exists a regional rule of customary international law in the Latin-American states as to the "national treatment" theory.

Accordingly, there is no rule of customary international law which establishes the minimum procedural safeguards to which an alien is entitled if prosecuted by a host state. Notwithstanding the existence of a general principle of customary international law pertaining to state responsibility when an alien has suffered injury or damage by an act or omission attributable to a state which is contrary or wrongful under international law, the home state of the alien cannot demonstrate that any denial of a procedural safeguard by a host state to an alien was contrary to or wrongful under international law.

In Chapter III, *Application of SOF "Fair Trial" Safeguards*, it was stated that the inclusion of explicit "fair trial" safeguards in the 13 nation NATO SOF Agreement and in seven bilateral status of forces agreements is a tacit but massive recognition by the United States and the other states concerned of the truth of the conclusions of Chapter II: that customary international law contains no demonstrable standards, no reliable criteria, for determination of what are the minimum procedural safeguards international law is said to require host states to accord aliens.

Since the ratification of the NATO SOF Agreement by the United States on July 25, 1953, there have been over 30,000 cases involving United States servicemen, civilian employees of the armed forces, and their dependents over which NATO countries, whose legal systems are different in whole or in part from that of the United States, had the primary right to exercise criminal jurisdiction under the formula set out in paragraph 3 of Article VII of this agreement. Of this number, over 4,000 cases were actually tried by such foreign countries. The purpose of Chapter III was to determine whether any differences of interpretation as to the application and meaning of these safeguards have arisen in their day-to-day implementation in the trials of thousands of United States servicemen under legal systems different from the United States and, if so, to isolate the manner in which these differences were accommodated. The analysis of these cases was largely empirical and was evaluated in the context of how the mutual defense goals and community interests of the countries concerned may have influenced their interpretation of the "fair trial" safeguards.

It was concluded that in the more than 4,000 cases of United States personnel tried by the tribunals of civil law countries during the past eight years there have been no major differences between the United States and such countries as to the application and interpretation of the NATO "fair trial" safeguards, except for the safeguard pertaining to "confrontation". The United States, however, has accepted the practice of civil law countries that confrontation includes only the right of the accused to be physically present when an adverse witness testified and has not objected

that it does not include the common law right of direct cross-examination by the accused. Further, during this period in only one case, the Baldwin case, has there been diplomatic intervention by the United States because of a denial of a safeguard under the procedure set forth in paragraph 4 of the Senate Resolution which was enacted at the time the Senate advised and consented to the ratification of the NATO SOF Agreement.

The favorable experience in the implementation of the NATO "fair trial" safeguards enjoyed by the United States and those NATO nations whose systems of law are different in whole or in part from that of the United States has been largely the result of their accommodation of each other's interests.

Some instances of this accommodation on the part of the authorities of NATO countries are their accelerating the trials of United States servicemen, their permitting a serviceman to promptly communicate with a representative of the United States upon his arrest, and their admitting a United States observer to sessions of a trial of a United States serviceman from which the public are excluded. Adjunctively, the military authorities of the United States have viewed foreign legal systems different from their own with sympathy and understanding and have cooperated with foreign authorities in the administration of justice in cases involving United States personnel.

The absence of any major controversy between the United States and these NATO countries illustrates how nations having different legal systems and cultures may, through a "back door" approach, interact with and upon each other in a social process to shape desirable community prescriptions which will promote a common goal. The common goal in this instance is the advancement of national self-defense by interdependence with other nations. Without this mutuality of interest, it is probable that overemphasis by the participating countries on technical rules and legal norms in the implementation of the NATO "fair trial" safeguards might have reaped dissension and contumely.

Chapter IV, *Denial of "Fair Trial" Safeguards and United States Forces*, considered the remedies a United States serviceman may have under international law and United States domestic law if he is denied a "fair trial" safeguard by a NATO country.

It was concluded that although a United States serviceman possessed an international personality to the extent of having been accorded a right to the safeguards set out in paragraph 9 of Article VII, of the NATO SOF Agreement, he does not possess the procedural capacity under international law to enforce this right by himself directly against the host country. Consequently, under international law he is not able to take any action against a host state because of its denial of a safeguard provided the serviceman by paragraph 9 of Article VII of the NATO SOF Agreement.

In the event of a denial of a procedural safeguard provided by the NATO SOF Agreement a United States serviceman under international law must rely on the United States to intervene with the host state to protect his right. Further, under United States domestic law, if the Secretary of State refuses to so intervene, the federal courts would probably not compel such intervention, as negotiation with a

foreign state is not a ministerial duty. Consequently, he possesses at most a passive or inchoate right to the safeguards set out in paragraph 9 of Article VII, *supra.*

In Chapter V, *Minimum Standard of Procedural Justice*, it is demonstrated how the experience of the NATO countries in successfully implementing the NATO "fair trial" safeguards in thousands of cases among different systems of law during the past eight years may be utilized to achieve a minimum standard of procedural justice for all aliens, and, ultimately, for all persons.

It was illustrated that because of the dichotomy among nations as to the "national treatment" theory and the "minimum standard" theory there exists no customary rule of international law which prescribes the procedural safeguards a host country must accord in the prosecution of an alien. Further, even if there were such a rule, an alien under traditional international law has no way of personally securing redress against a host state for its violation of the rule as the alien lacks an international personality.

It was concluded that there must be formulated a new basis for a minimum standard of procedural justice which is specific as to content and acceptable to all major legal systems in order to allay any suspicion on the part of weaker nations that it would be a vehicle for unlimited interference with their internal affairs. Once such a mutual basis is formulated, an appropriate vehicle to obtain its acceptance by states would be a universal multilateral convention.

In setting out these criteria should they be drafted as rights of the alien's home state, which would be consistent with traditional international law, or as direct rights of the alien?

After careful examination it was determined that it was juridically and philosophically unsound to continue to evade the reality that where a procedural safeguard is denied an alien by a host state it is the alien who should be directly protected rather than his state. Accordingly, the fiction of the injury to the state through the injury to its national should be abandoned. The minimum procedural safeguards for the protection of an alien who is prosecuted by a host state should be set out in a multilateral convention as direct rights of the alien together with provisions establishing procedures whereby an alien may secure vindication of his rights in the event of a denial thereof.

The minimum procedural safeguards contained in the NATO and other status of forces agreements are clear, are already familiar to a considerable number of states, and are likely to be acceptable to countries of all of the major legal systems of the world. Consequently, after appropriate amplification and refinement, they should be the basis of the procedural safeguards contained in the proposed multilateral convention.

Appendix 4 sets forth a draft article containing the minimum procedural safeguards to be included in the proposed multilateral convention.

Appendix 5 sets forth a draft article containing the procedures an alien may take in the event he is denied a procedural safeguard by a host state.

The draft multilateral convention proposed above is a means of resolving the existing controversy in international law as to the minimum procedural safeguards a host country must accord in the prosecution of an alien. Once the agreement of states has been obtained to such a convention there should emerge eventually from

the interaction of states, each upon the other, in the reciprocal implementation of these safeguards a common denominator as to their meaning. This decision making process should be accelerated by the fact that peoples everywhere are interdependent with respect to major values. In recent decades tremendous and sweeping changes in technology, transportation, population growth and movement, educational opportunities, economic development, and world organization have combined to alter the status of the nations of the world from one of comparative independence to one of ever increasing interdependence. This interdependence and the ever increasing acceptance of common community economic goals should encourage a nation signatory to the multilateral convention to accord in the prosecution of an alien the minimum procedural safeguards contained therein in the expectation that such procedure will maximize the opportunity for reciprocal treatment of its nationals abroad. Thus, through this informal approach there should be, even among nations having different legal systems and cultures, mutual agreement as to the meaning of the safeguards to be accorded aliens under the proposed multilateral convention.

At this time these procedural safeguards will be ripe for codification into a binding and enforceable bill of procedural rights, not just for aliens, but for all mankind.

The proposed convention, if adopted, would truly represent a pragmatic step in the realm of reality toward the achievement of a common standard in the area of minimum procedural rights "for all people of all nations" as contemplated by the abstract ideals of the *Universal Declaration of Human Rights.*

EXTRAORDINARY CONTRACTUAL AUTHORITY IN GOVERNMENT DEFENSE PROCUREMENT

by CECIL THOMAS LAKES*

On December 16, 1950, the President of the United States issued a proclamation declaring a national emergency. The proclamation of the national emergency was predicated on the fact that the United States and the other countries of the Free World were threatened by an aggressive and hostile ideology represented by Soviet Russia and her allies. That proclamation is still in effect. Recent international developments indicate that the proclamation will continue in effect for the foreseeable future.

* A.B. 1948, LL.B. 1950, University of Cincinnati; LL.M. 1960, The George Washington University; S.J.D. conferred June 6, 1962. Professor in charge of research: Ralph Clarke Nash, Jr., *Associate Professor of Law.*

During the emergency our national policy is one of military preparedness with the dual objective of preventing a war and, failing this, of winning any war that is thrust upon us or our allies. The national policy of military preparedness requires the maintenance of a large military establishment. The maintenance of a large, modern, and effective military establishment, in turn, requires the procurement of vast quantities of supplies and services. The military departments spend over twenty-five billion dollars annually in defense procurement. This, however, does not represent the annual total amount of defense procurement since many of the civilian departments and agencies of the Government spend part of their annual appropriations for supplies and services for defense purposes.

In order to provide the Executive Branch of the Government with sufficient power to effectively carry out our large annual procurement program, Congress enacted, and on August 28, 1958, the President approved Public Law 85-804. Public Law 85-804 provides that "the President may authorize any department or agency of the Government which exercises functions in connection with the national defense . . . to enter into contracts or into amendments or modifications of contracts heretofore or hereafter made, and to make advance payments thereon, without regard to other provisions of law relating to the making, performance, amendment, or modification of contracts, whenever he deems that such action would facilitate the national defense." Public Law 85-804 states that it will be effective during a national emergency declared by Congress or the President, and it is presently effective under the presidential proclamation of December 16, 1950. The legislation embodied in Public Law 85-804 is not new. This law had its origin in and is in effect a continuation of Title II, First War Powers Act, which was enacted at the start of World War II. The substantive provisions of Public Law 85-804 are substantially similar to those contained in Title II, First War Powers Act. Title II, First War Powers Act, was reactivated during the Korean War and extended on various occasions until June 30, 1958. The powers conferred on the President by Title II, First War Powers Act and now under Public Law 85-804 may best be described as extraordinary. This is an apt description for under such powers the federal departments and agencies, to which the President delegates the authority, may enter into, amend, and modify defense contracts, and make advance payments thereon even though such actions are in direct contravention and violation of statutory or common law pertaining to these matters. Lessons learned during World War I, World War II, and the Korean War, revealed that these extraordinary powers were necessary if the Government was to effectively procure the vast quantities of supplies and services needed during such wars. While the ordinary powers possessed by the Executive Branch of the Government may be adequate for peace time procurement, they are, however, too rigid and inflexible to support the large procurement programs necessitated by a war. These extraordinary powers are now needed because defense procurement during the present national emergency is approaching the magnitude of war time procurement.

On November 14, 1958, the President, acting pursuant to the authority conferred on him by Public Law 85-804, issued regulations in implementation thereof and delegated the powers thereunder to the Secretary of Defense, the Secretaries of

the Army, Navy, and Air Force, and to the following civilian departments and agencies:

Department of the Treasury
Department of the Interior
Department of Agriculture
Department of Commerce
Atomic Energy Commission
General Services Administration
Office of Civil and Defense Mobilization
National Aeronautics and Space Administration
Federal Aviation Agency
Tennessee Valley Authority
Government Printing Office

Since the military departments are the departments primarily concerned with the national defense it was obvious that they would be the primary users of Public Law 85-804 and for this reason the President specified that the regulations issued by the civilian departments and agencies in implementation of Public Law 85-804 were to be uniform to the extent practicable with those issued by the Secretary of Defense. On January 5, 1959, the Secretary of Defense issued regulations in implementation of Public Law 85-804. These regulations are contained in Section XVII of the Armed Services Procurement Regulation which are entitled "Extraordinary Contractual Actions to Facilitate the National Defense." The National Aeronautics and Space Administration has issued regulations substantially similar to the Department of Defense regulations and the General Services Administration will shortly issue regulations applicable to the other civilian departments and agencies which, likewise, will be substantially similar to the Department of Defense regulations.

Public Law 85-804 and the implementing presidential regulations are general in scope and do not prescribe standards or guides under which the powers conferred by the Act are to be exercised. Standards or guides, however, are set forth in the Department of Defense regulations and the regulations of the civilian departments and agencies. These regulations divide the authority of Public Law 85-804 into three categories, viz., contractual adjustments, residual powers, and advance payments, and spell out, in somewhat general terms, standards and guides under which these actions may be accomplished.

The types of contractual adjustments authorized by the regulations are amendments without consideration, correction of mistakes, and formalization of informal commitments. Contracts may be amended without consideration in two types of cases. One type of case is commonly referred to as essentiality and the other is commonly referred to as government action.

The validity and interpretation of government contracts are in general governed by legal principles applicable to contracts between private individuals. These principles, however, are found in the federal common law and not state law. Therefore, as in private contract law consideration is required for a valid government contract. Unlike the rule obtaining in private contract law, however, the consideration moving to the government must be adequate and proportional. Thus, it may be stated that

under the federal common law rule a valid government contract or an amendment of a government contract must be supported by adequate and proportional consideration moving to the Government.

Notwithstanding the federal common law rule pertaining to consideration, a government contract may be amended without consideration under Public Law 85-804 on the basis of essentiality and government action. Relative to essentiality the regulations provide that "where an actual or threatened loss under a defense contract, however caused, will impair the productive ability of a contractor whose continued performance on any defense contracts or whose continued operation as a source of supply is found to be essential to the national defense, the contract may be adjusted but only to the extent necessary to avoid such impairment to the contractor's productive ability." In general, it may be stated that the basis for a finding of essentiality is whether the contractor is producing an item that cannot be procured from another source in time to meet an urgent government requirement for such item.

In addition to the essentiality test a government contract may be amended without consideration under Public Law 85-804 on the basis of government action. In this regard the regulations provide that an adjustment may be made in a contract by way of an amendment thereof without consideration where government action, although not creating any legal liability on the part of the Government, has caused a loss or the incurrence of increased costs in performing the contract. Although the Government may be sued under the Tucker Act on its express and implied contracts, it may not, however, under federal common law principles, be sued under such act where the obstruction to performance of the contract resulted from action by the Government in its sovereign capacity. The Contract Adjustment Boards, which have been established to decide requests for contractual adjustments, follow the federal common law rule and do not grant relief where sovereign action of the Government has caused the loss. The Boards possess the authority to grant relief under this circumstance but do not do so primarily because it would be giving the government contractor an advantage over other firms which do not hold a government contract but which are similarly affected by the sovereign act of the Government.

In the event the loss to the contractor was caused by the Government in its capacity as the other contracting party, relief will be granted the contractor if in the terminology of the regulations "considerations of fairness . . . make appropriate some adjustment in the contract." In other words the Contract Adjustment Boards apply, generally, equitable principles in determining whether relief should be granted under the government action test.

In the area of mistakes in contracts the government contractor may obtain relief in the federal courts and also from the General Accounting Office. In addition, the contractor may obtain relief relative to a mistake in its contract under Public Law 85-804. The Contract Adjustment Boards, in general, apply the same legal principles that are applied by the courts and the General Accounting Office in correcting mistakes in contracts.

The third type of contractual adjustment that is authorized to be made under Public Law 85-804 is formalization of informal commitments. In transactions between private individuals the acts of an agent may bind the principal even though

the agent entering into the contract acts beyond or outside the scope of his actual authority. If the principal so conducts himself as to give the agent the appearance of authority the principal may be bound to any third party who relies in good faith on such appearance of authority. The principle that is invoked to hold the principal in this situation is that of apparent authority or estoppel. However, in the law of government contracts it is a well-established common law principle that the doctrine of apparent authority or estoppel is not applicable against the Government with the consequence that the Government is not bound by the acts of its agents unless they act within the scope of their actual authority. Although an individual may not obtain relief from the courts or the General Accounting Office on the basis of apparent authority or estoppel such relief is available, however, under Public Law 85-804. This relief is referred to by the regulations as the formalization of an informal commitment. The regulations provide that an informal commitment may be formalized to permit payment to persons who, in reliance in good faith on the apparent authority of a government agent, have furnished or have arranged to furnish supplies or services to the Government. In formalizing informal commitments the Contract Adjustment Boards generally apply legal principles applicable to apparent authority. Public Law 85-804 places a limitation on the formalization of an informal commitment for it states that such commitment shall not be formalized unless it is found that at the time the commitment was made it was impracticable to use normal procurement procedures. Since informal commitments often result from mistake of fact or ignorance of applicable laws and regulations on the part of government agents, the question arose as to whether the limitation of the statute prohibited the formalization of an informal commitment made under such circumstances. The Army Contract Adjustment Board decided that the limitation did not apply to informal commitments made through error or mistake but only to those where the commitment was deliberately made as a means of evading normal procurement procedures.

Various problems and questions have arisen relative to contractual adjustments. A problem that arose under Reactivated Title II was whether relief should be granted contractors by amendments without consideration on the basis of financial hardships incurred as a result of a loss under a government contract. The Senate Select Committee on Small Business held an investigation relative to the administration of Reactivated Title II and concluded as a result thereof that relief should be granted on such basis. The Secretary of Defense refused to amend the implementing regulations to provide for relief on the basis of financial hardship, because the only benefit accruing to the national defense therefrom would be the over-all benefit to the national economy, a proposition which was felt to be so broad that it should only be accomplished under specific legislation. Although various bills were introduced in Congress which would have authorized amendments of contracts without consideration on the basis of financial hardship all such bills failed of passage. Thus, it may be safely concluded that a contractor may obtain relief under Public Law 85-804 by way of an amendment of its contract without consideration only on the basis of essentiality or government action.

The question of the timeliness of an application for a contractual adjustment has been the source of some difficulty. This is true not so much in the area of in-

formal commitments as in the areas of amendments without consideration and mistakes. In order for an application for the formalization of an informal commitment to be timely it must be filed, according to the regulations, within six months after furnishing or making arrangements to furnish supplies or services to the Government. Relative to amendments without consideration and mistakes, the regulations are not this explicit for they provide that relief shall not be granted by an amendment without consideration unless the application therefor was filed before final payment and before all obligations were discharged under the contract. Before final payment all obligations obviously would not be discharged under a government contract, and after final payment there may still be obligations outstanding under the contract. Although the regulations are ambiguous, they have been interpreted to mean that an application is timely if filed while any obligation is outstanding under the contract. If the application is filed after the contract is fully executed on both sides relief may still be granted a contractor, not by way of amendment of the nonexistent contract, but by a new contract. However, the contractor's possibility of relief would be enhanced by a timely application.

While the question has arisen as to whether relief could be made available to a subcontractor under Public Law 85-804, the answer now, however, appears quite clear that in appropriate cases relief may be made available to subcontractors. Another question or problem has been the extent of relief that may be granted to a contractor by way of a contractual adjustment under Public Law 85-804. The problem stems from the fact that the Comptroller General, in correcting mistakes in contracts, will not grant relief to an extent that will increase the contract price above the next low bid or proposal. On analysis it is quite clear as to the authority of the Contract Adjustment Boards in this regard, but notwithstanding, this has been an area of much confusion. In short, it may be stated that there are no legal, policy, or other reasons that would preclude the granting of relief in essentiality and government action cases to an extent that would increase the contract price in excess of the next low bid or proposal. Although the Boards have the power to do so, they do not, however, based on policy considerations, normally grant relief in mistake cases in excess of the next low bid or proposal.

One other area that has caused misunderstanding among government contractors is that relating to the required finding of the facilitation of the national defense in every action taken under Public Law 85-804. If a Contract Adjustment Board finds that a contractor is essential in an essentiality case it will, without more, find that the granting of relief will facilitate the national defense. If the Board finds in a government action case that considerations of fairness warrant relief it will likewise, without more, find that the granting of relief will facilitate the national defense. In the areas of mistakes and informal commitments the regulations contain so-called "automatic" or "built-in" findings to the effect that the granting of relief in these cases will normally facilitate the national defense by assuring persons that they will be dealt with fairly and paid expeditiously in such cases.

On several occasions contractors having had their requests for contractual adjustments denied by the Contract Adjustment Boards have sought judicial review of such decisions in the Court of Claims. The Court of Claims has refused to upset these decisions. However, the court has stated by way of *dicta* that it would review

and upset a decision if it were arbitrary, capricious, or so grossly erroneous as to imply bad faith. These *dicta* are inconsistent with a great number of Supreme Court cases which hold that the exercise of discretionary acts on the part of administrative officials is not subject to judicial review even if such acts are an abuse of discretion. Some support can be found, however, for the *dicta* of the Court of Claims since the Supreme Court has on some occasions granted judicial review on the basis of an abuse of discretion. In view of these inconsistent decisions of the Supreme Court it would be difficult to predict whether an action under Public Law 85-804 would be subject to judicial review on the basis of an abuse of discretion. Although the Court of Claims indicated by way of *dicta* that it would review an action on this basis there is, however, no square holding to this effect.

The regulations implementing Public Law 85-804 state that the term "residual powers" covers all authority under the Act except contractual adjustments and advance payments. A precise definition of what the term residual powers include would be difficult to formulate due to the breadth of actions that may be taken under such powers. In this regard it may be stated that any action may be taken in the procurement field under such powers provided that the action is not prohibited by the Act and the presidential regulations, and provided further that it is determined that the action will facilitate the national defense. The residual powers have been used as the authority for a multitude of purposes, however, the most frequent use of such powers has been for the sale or other disposition of government property and for the inclusion of indemnity provisions in extra-hazardous contractual undertakings where the contractors could not obtain commercial insurance.

Advance payments, which are loans to enable government contractors to perform their contracts, are specifically authorized by Public Law 85-804. In the absence of specific statutory provisions, advance payments could not be made in view of a statute which prohibits such payments except when "authorized by the appropriation concerned or other law." In addition to Public Law 85-804 advance payments are authorized by 10 U.S.C. § 2307. Although the authority of Public Law 85-804 is much broader than 10 U.S.C. § 2307 the regulations, however, place the same limitations and restrictions on advance payments regardless of which law is being utilized. In view thereof, and a requirement in the regulations that Public Law 85-804 may not be used if other adequate authority is available within the department, advance payments are now being made under 10 U.S.C. § 2307 and not under Public Law 85-804. The broader authority of Public Law 85-804 is available and may be used for making advance payments if at any time the Secretary of Defense should determine that 10 U.S.C. § 2307 is inadequate for such payments.

The United States is spending a major part of its tax dollar in defense procurement in order to carry out our national policy of military preparedness. Over twenty-five billion dollars is spent each year in defense procurement. In a procurement program of this magnitude things can go wrong: mistakes are made, informal commitments are undertaken, and losses are incurred in performing government contracts. The normal powers possessed by the Executive Branch of the Government are not adequate to cope with the many problems that arise in this area. These problems are now being resolved in the interest of the national defense under the extraordinary powers conferred on the Executive Branch of the Government by Pub-

lic Law 85-804. There has been criticism of the administration of this law and its need has been questioned. The Congress and the President believe that this law is necessary in the interest of national defense and this appears to be the generally accepted view. Thus, as long as defense procurement continues at its present pace it may be expected that the Government will exercise extraordinary contractual authority to insure that such procurement is accomplished effectively and expeditiously in the interest of the national defense.

MANUFACTURERS' EXCISE TAXES

by SHERWIN CARL PELTIN*

I. GENERAL CONSIDERATIONS

1. "Indirect taxes", excises or occupation taxes, affect rights or privileges. "Manufacturers' excise taxes" tax manufacturers' sales and equivalent circumstances.

2. As trade increased, tolls, collected in earliest feudalism, produced major revenues. Authorities oppressively taxed necessities during the 1600's. English opposition expanded and French and American excises contributed to revolutions.

After 1700, more uniform luxury taxation eliminated unrest. Collectors began to receive fixed salaries. Taxation at manufacturing or wholesaling levels was introduced.

One unpopular excise produced the 1791 "Whiskey Rebellion". The 1794 act taxed carriages, liquor, snuff, sugar, and auctions. Following Jefferson's election, most excises were abolished.

Customs supplied revenues except during the 1812 War when familiar excises were required. In 1862, decreased customs and increased expenditures required excises on beer, tobacco, luxuries, and manufactures, among others. In 1864 rates were increased and taxes expanded.

From 1866 through 1870, rates were reduced and taxes removed. By 1890, remaining liquor and tobacco taxes, from 1868 to 1898, produced 41 per cent of revenues. War required stamp and occupational taxes. By 1903, remaining liquor and tobacco taxes produced 45 per cent.

During World War I, manufacturers' taxes affected matches, automobiles, sporting goods, instruments, phonographs, records, cameras, flour, coin machines, candy,

* B.B.A. 1950, LL.B. 1952, University of Wisconsin; LL.M. 1955, New York University; S.J.D. conferred June 6, 1962. Professor in charge of research: James Forrester Davison, *Professor of Law.*

and soft drinks. Although collections quadrupled between 1914 and 1919, excise revenues fell from 46 to 28 per cent.

After the War, rates were reduced and taxes removed. Tobacco taxes became the principal excise. Depression depleted income taxes from 70 per cent of revenues to 36. The resulting 1932 act included most current manufacturers' excises. From 1930 to 1935, excises increased from 16 to 47 per cent of revenues.

In 1942 rates were raised and new items taxed. Nevertheless, excise revenues from 1940 to 1944 fell from 50 to 11 per cent. 1945 and 1948 acts postponed reductions. The 1951 act adjusted rates, deleted some sporting goods, and added appliances, fuels, pens, pencils, and lighters. Annual acts through 1959 postponed reduction.

3. Taxes are on income: (a) in production (business and occupation, business property); (b) distributed (income); (c) consumed (excises or duties); and (d) saved (transfer, gift, or successions). A less theoretical classification characterizes the individual affected: (a) property owner; (b) businessman; (c) consumer; and (d) income recipient.

Consumption taxes are directly collected from consumers and indirectly collected from vendors. A broad classification is on products taxed: (a) necessities; (b) semi-luxuries; (c) luxuries; and (d) harmful products.

Present selective excises include: (a) sumptuary (liquor and tobacco); (b) retailers' (jewelry, furs, cosmetics, luggage); (c) manufacturers' (outlined herein); (d) facilities and services (communications, transportation, admissions, dues); (e) documentary stamp taxes, and (f) miscellaneous.

Sumptuary excises, producing half of excise collections, represent public moral judgment. Luxury excises, producing a quarter, supplement progressive income taxes. "Benefit" excises, producing one-sixth, tax products promoting government expenditures. Miscellaneous excises, producing one-twelfth, meet revenue needs.

4.a. One excise advantage is yield stability. Progressive income taxes resist stable yields. Income tax collections rise or fall along with incomes. *Ad valorem* collections change proportionately to taxable product values. Unitary collections are less changeable. Excises on products with relatively inelastic demands produce constant revenues. Non-necessity excises decline in depression.

b. Excises tax income otherwise exempt. Exclusions, deductions, and exemptions erode the income tax base. Excises are generally unavoidable.

c. Another advantage is collection convenience. The few tax-reporting units already maintain necessary records.

d. Low excises could ease high income taxes. Excessive income rates encourage specific relief, inhibiting maximum application, and purportedly, reduce incentives.

5.a. A major disadvantage is "pyramiding". A manufacturers' excise on end products would increase manufacturers', wholesalers', and retailers' costs of plant, equipment, fixtures, parts, tools, furniture, and supplies by the tax and increased distributors' expenses, as well as property taxes, insurance premiums, repairs, and depreciation. Ultimate price increases, sufficient to recover costs, would greatly exceed the tax.

b. The outstanding objection is regressivity: proportionately greater impact on lower incomes. Percentage expenditures for consumption decline as income increases. Lowest and highest income groups are principally affected. Sales taxes bear disproportionately on the lowest brackets. Other taxes are also regressive and income taxes not sufficiently progressive.

c. Regressivity reduces consumer spending power. Pyramided excises reduce real incomes of persons spending all. As purchases contract, sales and profits decline, turnover slows, production slackens, labor demands fall, wages are depressed, all depleting income taxes. For consumers without rigid savings patterns, excises discourage spending. Those with savings patterns must reduce spending, both decreasing consumption and production.

d. About two-thirds of the selective excise burden falls on consumers. Unshifted burden decreases funds, expansion incentives, business activity, profits, and incomes.

6. Excises accomplished nonrevenue purposes. Considered anti-inflationary during World War II, excises diverted income from bidding up prices. High taxes penalize deleterious activities and products. Lesser public disapproval and regulatory purposes are reflected in sumptuary taxation. Excises penalize "luxury" commodities.

II. 'MANUFACTURER' DEFINED

1. "Manufacturing" makes raw materials usable. Taxable manufacturers ordering work may neither employ workers nor own a factory or materials. "Manufacturers" produce taxable articles from scrap or new material, by processing, combining, or changing form. Attaching trade names to nonexclusive purchases is not manufacturing.

2. A 1952 policy reversed an exclusion of custom-made seat covers as automobile accessories. Trial courts generally sympathized, but not appellate courts. Neither administration nor legislation supports custom seat-cover makers.

Although contending it merely services, this operation is indistinguishable from manufacturing stock covers. Differences are in quality, service, and price. Tax relief would discriminate against stock cover dealers. Tax-paid prices diverted no appreciable business.

3. "Manufacturing" includes "rebuilding", but not reconditioning and repairing. Mere disassembling, cleaning, and reassembling is reconditioning. "Rebuilding" includes rebabbitting connecting rods, resurfacing clutch plates, rewinding armatures, and reboring motors, for sale. "Repairing" is performed upon customers' parts.

Distinguishing rebuilding from reconditioning evades solution. Replacing battery cells or plates, or assembling from salvaged components is manufacturing, but not replacing incidental separators or casings. Resurfaced clutch plates are tax-free if parts are purchased tax-paid. Reassembled transmissions are taxed on parts machined.

Before 1951, rebuilders were taxed on both work and "exchange" value. This presented a difficult valuation problem and was inequitable duplicated taxation. Added value alone was manufacturing. Used parts relating to specific sales, like

the rebuilt parts for which exchanged, are not excluded. Nonautomotive rebuilding is inconsistently not taxed. Tardy enforcement or policy change could produce retroactive assessments. Taxing rebuilding causes disproportionate collection cost.

Rebuilders include assembly-line factories meriting no tax advantage. Removing the tax would discriminate against new parts manufacturers.

4. Petroleum re-refiners reclaim waste oils by processes identical to crude refining. In 1955, the Treasury reversed earlier rulings holding re-refining taxable.

Used oil being valueless, only manufacturing was taxed. Both re-refiners and refiners are "cleaning". Re-refiners argue irrelevantly and unconvincingly that re-refining conserves oil and prevents air and stream pollution, and fires. *Ad valorem* taxation would avoid industry destruction. Taxpayers have no rights in erroneous nontaxability.

Refiners must buy or produce materials. Re-refiners' taxpaid prices should be lower.

Both re-refining and parts rebuilding reprocess used items to compete with new. Inconsistent treatment cannot logically reflect Congressional intent.

5. Persons working materials not owned may not be taxed. Contractors who can not use or resell merely contract to work. Hiring employees, agents, or subcontractors is indistinguishable. Patent holders ordering patented items at specified prices are manufacturers.

III. POINT WHERE TAX ATTACHES

1. Manufacturers' excises attach on sales when title passes, based on intention, determined from the contract, attendant circumstances, and local presumptions. Manufacturers incur tax, although receiving partial or no payment.

Articles undelivered, or shipped on bills of lading with draft attached, unpaid, before the effective date of the tax, are taxed on subsequent delivery. Where paid, title had previously passed.

Passage of title upon delivery to carriers is taxable. No subsequent damage or destruction affects liability. Indemnifications are not sales. If title passes on delivery to purchasers, property destroyed in transit is not taxed. Reduced prices of damaged articles are taxed. Transfer to carriers for salvage is not taxable; carriers are taxable on resale above scrap value. Gasoline tax is refunded for casualty in transit or while held for resale.

2. Under the 1939 Code, leases were taxed at the effective rate at execution with tax apportioned to lease payments. Renewals were taxable. 1954 Code clarifications equated renewals, extensions, and "subsequent leases", apparently "tacking" leases, repudiating contrary authority.

P.L. 85-859 limited tax on leases to "total tax" on the constructive fair market price on retail sales when first leased, providing lessors also sold. Sales after "total tax" payment are tax-free, and sales preceding are taxed at the effective rate. The tax is limited to that on retail sales.

3. On other leases, installment, conditional, and chattel mortgage sales, tax is proportionate with each installment. Except for leases, payments eventually cease and subsequent resales are not taxable.

4. Manufacturers' use of their products is taxed at the normal selling price.

Use of taxable articles, except tires, as components or materials in other taxable items is taxable. Manufacturers' use of tires, tubes, automobile radios and television sets as automobile parts is taxable. Auto parts, radio and television components, or camera lenses used as components or materials in *any* article are not taxable. Radio and television used in commercial, military, or marine devices for governmental use are excluded. Incidental manufacture for personal use is not taxed.

5. Persons acquiring taxable items in nontaxable transactions or by operation of law are taxed on sale, lease, or use. Examples are receivers, assignees for creditors, trustees in bankruptcy, successor partnerships, consolidated corporations, and stockholders continuing dissolved businesses.

IV. TAXABLE SALES PRICE

1. Price includes charges of readying for shipment, including shipping room labor, overhead, containers or coverings. Separate billings or refund agreements are immaterial. Refunds of tax on containers returned are permitted.

2. Costs after packing ready for shipment are excluded; e.g. transportation, delivery, insurance, and installation. Shipment costs to or between warehouses are not excludable except in filling sales or to meet quantity requirements. Items "packed ready for shipment" are ready for delivery from warehouses.

3. Price adjustments to manufacturers' vendees, including quantity bonuses or rebates, warrant tax credits.

4. Articles returned for refund are tax-free. On exchange of new taxable articles, only cash paid is taxed. Noncash exchanges are not taxable. Tax applies to "trade-ins" and cash.

5. The statute excludes narrowly-defined charges for other than manufacturing, selling, or readying articles for shipment. Advertising is included in "price".

6. Early rulings excluded separate guarantee charges, not exceeding service value, and included uniform charges covering future warranty costs.

The Court of Claims twice held a mandatory repair charge collected from all purchasers not detachable. It was in the cost when packed ready for shipment. However, costs of fulfilling warranties were allowances.

The Court admitted error: the charges were for a nontaxable agreement as previously contended. Reasonable charges were excludable. One-year "free" warranty costs were nonexcludable costs of items as originally expected.

In 1958, the Court cited distinguishing evidence: warranties were customary, separate charges merely dividing the price. Required fees are part of purchase prices, at least for customary service. Costs of fulfilling warranties are not allowances.

7. On consignment sales, fair market price is taxed. The Commissioner determines price in sales below fair market price, not at arm's length.

Manufacturers' retail sales are taxed on average prices for the smallest wholesale lots. Retail prices are discounted by standard industry markups. If none, prices are estimated. Taxpayers have no recourse and rarely know the method.

Sales to subsidiaries avoids discrimination on sales to retailers. Being not at

arm's length, fair wholesale prices are determined. This procedure exists by Service sufferance. Elimination of competitive disadvantages is rarely communicated to competitors, creating new discriminations. Subsidiaries created to combat taxes are undesirable. Inability to create subsidiaries causes discrimination.

Following a 1955 Congressional Subcommittee recommendation, manufacturers regularly selling at wholesale and at arm's length at retail, not the industry method, are taxed on their highest wholesale prices.

V. ITEMS SUBJECT TO TAX

1. Sales of chassis and bodies of automobiles, trucks, highway tractors, busses, trailers, included parts or accessories are taxable.

Vehicles used around factories, depots, and airports, farm equipment, housetrailers, toys, racers, construction equipment, nonhighway trailers, and self-propelled snowplows are excluded.

2. Automobile parts or accessories, except tires, tubes, automobile radio and television sets, are taxable, including spark plugs, batteries, leaf springs, coils, timers, and chains.

Taxable articles primarily used to improve, repair, or become components include parts for engines, transmissions, brakes, bumpers, differentials, speedometers, batteries, wipers, radiators, axles, and steering mechanisms.

Taxable articles designed to increase utility or ornamentation include air conditioners, floor mats, license frames, lights, tanks, truck racks and tops, antennae, safety belts, signals, window devices and clocks.

Taxable nonessential articles primarily used with vehicles include baby equipment, lighters, lighter outlet appliances, hoppers, jacks, visor attachments, tire pumps, taximeters, and tools.

Excluded items generally usable elsewhere include bearings, bushings, nuts and bolts. Excluded items installed in repair services are glass and top covers. Excluded raw materials include uncut brake lining and unfitted piston castings. Excluded items for testing or repairing are brake testers, grease guns, and tire gauges. Also excluded are burglar systems, emblems, and taxicab signs.

3. Manufacturers' sales of tires, tubes, and tread rubber usable in transporting persons or burdens are taxed. Tires not exceeding 20 inches in diameter and 1¾ inches in cross section, and extruded tires with internal wire fasteners are excluded. Tires on motor scooters, trailers, racers, industrial trucks, and wheelbarrows are taxed.

4. Gasoline sales are taxed "per gallon". Aviation gasoline and engine distillate are taxable. Benzol, benzene, or other liquid fuels for propulsion are taxed at retail. Kerosene and fuel oils not for propulsion are excluded.

5. "Cutting" and "lubricating" oils are taxed "per gallon". "Cutting oils" are used in metal cutting, machining, forging, drawing, stamping, drilling, and turning. "Lubricating oils" are oils sold, or suitable, for lubricating. Oil for flushing crankcases is taxable if parts are moving. Sweeping compounds, petrolatum, solvents, and "white oil" are not taxable.

6. Manufacturers' sales of household refrigerators, freezers, and self-contained

air conditioners operated by electricity, gas, kerosene, or gasoline are taxed. "Household refrigerators" not exceeding 14 cubic feet, are designed for domestic use, providing refrigerated food storage or making ice cubes. Household freezers, not exceeding 25 cubic feet, are used domestically, including in trailers.

Air-conditioners requiring frozen substances are not taxable. Taxable units are installed in or near windows, move, dehumidify, and circulate room air, and have less than one horsepower.

7. Manufacturers' sales of electric, gas, and oil household appliances, including incinerators, door chimes, garbage disposals, dryers, flatirons, and mangles are taxed. Omitted are vacuum cleaners, floor polishers, and washers.

Household "belt-driven" fans have blade diameter under 40 inches, unless otherwise designed. Intended design of "motor-driven" fans controls. Humidifier, air purifier, or furnace fans are excluded.

Taxable household appliances to cook or keep warm food or beverages include coffeemakers, ranges, roasters, toasters, waffle irons, and griddles. Institutional dishwashers, large coffee urns, combination gas and wood ranges, charcoal igniters, and hand dryers are not taxed.

Household water heaters do not exceed 7,500 watts or 50,000 b.t.u.'s per hour. Power lawn mowers, including rider-operated, under 24 inches cutting width are taxable "household type" unless otherwise designed.

8. Manufacturers' sales of light bulbs and tubes are taxed, including religious glow-lamps, miniature Christmas bulbs, night and sickroom lights, and neon tubing. Bulbs for blueprinting, copy work, projectors, or laboratory instruments are not taxable.

9. Manufacturers' sales of radios, television sets, combinations, components, phonographs, and records are taxed.

Taxable components are cabinets, chassis, tubes, speakers, amplifiers, power supply units, built-in antennae, phonograph mechanisms, and record players.

Nontaxable are bezels, escutcheons, oscilloscope analyzers, detection receivers, photophone systems, individual listening devices, paging systems, unlisted parts, movie or radio transcriptions, and V.H.F. converters.

10. Manufacturers' sales of all musical instruments and essential included components are taxable, including chimes with keyboards, maracas, bongos, castanets, and claves. Toy plastic guitars, ukeleles, flutes, and slide whistles are not taxable.

11. Manufacturers' sales of enumerated sporting goods are taxed, including badminton, squash, table tennis, tennis, golf, bowling, fishing, pool, and croquet equipment. Unfinished poles, toy golf or ski equipment, and archery, hunting, riding, boxing, wrestling, baseball, basketball, football, water-skiing, and skin-diving equipment are not taxable.

12. Manufacturers' sales of cameras, lenses, film, household projectors, and included parts or accessories are taxed. X-ray and cameras exceeding four pounds, lenses exceeding 30 millimeters, X-ray film, perforated microfilm, film exceeding 150 feet, or 25 feet long and 20 millimeters wide, "adapters" for holding film, and print copiers are excluded.

13. Manufacturers' sales of pistols, revolvers, other firearms, shells, and cart-

ridges are taxed. Machine guns and short-barrelled firearms are excluded. Interchangeable parts are not taxed. Kits, containing essential parts, are taxable.

14. Manufacturers' sales of listed business machines and included accessories are taxed. Cash registers, miniature adding machines, music typewriters, nonnumbering and nonperforating cancelling or dating machines, electronic computers, pocket pencil sharpeners, cases, vending machines, supplies, and stands are excluded. Machines for perforating; fastening paper: dating and numbering; numbering film negatives; mailing and sealing; sharpening pencils; and recording dictation are taxable.

15. Manufacturers' sales of lighters, mechanical pencils, fountain, and ballpoint pens are taxed. Ball pens without nonessential parts are taxable. Lighter mechanisms and felt-tipped marking pens are excluded.

16. Manufacturers' sales of matches are taxed.

VI. EXEMPTIONS FROM TAX

1. Selective excises tax only enumerated items. "Exemptions" allow tax-free sales of taxable items. "General exemptions" apply generally, and "special exemptions" to specific items.

2. Exemptions are obtainable by refunds. Besides general refund requirements, special requirements concern excises. Taxpayers must establish that the tax was (a) never collected; (b) repaid to the ultimate purchaser or seller; or (c) collected from the ultimate purchaser who consented to refund. "Ultimate purchasers" purchase for consumption or use.

3. Exemptions are obtainable by tax-free sales. Tax-free sales require advance registration by manufacturer and purchaser. The Commissioner may cancel registrations to protect the revenues. Registration, applicable to general exemptions, may be extended to certain specific exemptions.

Tax-free sales to governmental units without registration require (a) manufacturers' knowledge of such expected purchase and (b) exemption certificates. Also excepted are export sales to foreign purchasers. Federal instrumentalities may purchase and sell for exempt purposes without registration. Registration will not apply to proved export of mechanical pencils and pens.

4. Exemption of sales of, or sale for resale for, further manufacture prevents taxing sales both to and by manufacturers.

"For further manufacture" means as material in manufacture or as components of another taxable article, becoming a tangible part thereof, except radio and television components and lenses. Materials consumed in production are not components. Items maintaining form and substance are used in further manufacture. Gasoline and oil remaining in manufactured automobiles is exempt. Bulbs for incorporation into nontaxable sub-assemblies are not exempt, but bulbs are exempt for use in taxable radios.

Purchasers buying for further manufacture are taxed alternatively on selling or purchase price unadjusted.

5. Sales for, or for resale for, export including shipment to possessions, are exempt, if proved within six months. Advance knowledge of destination is required

for vehicles, refrigerators, air conditioners, appliances, radios, television, phonographs, and records.

"Exportation" includes delivery of foreign orders to the dock for export, sales to Americans overseas for eventual disposal abroad, and automobiles driven abroad directly from the factory. Automobiles sold for domestic use are not for export although the foreign buyers intend taking the automobiles abroad.

Sale for consumption aboard ship is not for export.

6. Supplies, stores, or equipment on ocean-going vessels, including aircraft, are exempt. Supplies sold to ocean vessels are exempt, although later diverted. Supplies furnished to coastal vessels are not exempt although diverted to foreign trade. Sales for use in company aircraft for transportation to company foreign properties are not exempt.

7. Sales to states, or political subdivisions, for their exclusive use are exempt. Sales to the following are exempt: counties; municipalities; humane societies; local redevelopment agencies; schools; volunteer fire departments and rescue squads; irrigation, power, and recreation districts; flood control commissions. The following are not: self-help associations, private hospitals, electric cooperatives.

Sales not exempt include sales to municipalities for nongovernmental uses or for resale.

8. Sales to nonprofit educational organizations for their exclusive use are exempt. Their primary function is formal instruction at one place where they normally maintain a faculty, curriculum, and enrolled students.

9. Manufacturers' sales to representatives of foreign governments, their families, households, and staffs of their countries' missions, but not American employees or permanent residents, agents or commissioners, are exempt.

Also exempt are articles (a) subject to retailers' jewelry tax, except clocks, watches, or parts sold as parts or accessories; (b) manufactured by Indians under government jurisdiction.

10. Specially exempt are manufacturers' sales for resale: (a) bodies to vehicle manufacturers; (b) gasoline to producers; and (c) lubricating oils to producers. Purchasing manufacturers are ultimately taxed on items purchased for re-sale.

11. Partial refunds are allowed to gasoline purchasers for nonhighway uses or for federal vehicles used off highways. Exempt uses are: nonhighway conveyances, stationary machinery, and burning.

Transit systems deriving 60 per cent of passenger revenue from scheduled routes, free of transportation tax, are allowed partial refunds.

Full refunds are allowed for gasoline used on farms, including cropdusting or spraying orchards, but not spraying lawns or transporting produce on roads. Nurseries and livestock feed-lots are farms.

12. Also exempt are (a) automobile parts for farm equipment, except spark plugs and batteries; (b) tread rubber not for recapping tires; (c) musical instruments to religious institutions for exclusively religious purposes; and (d) firearms and ammunition for federal military uses.

SUMMARY OF DISSERTATION
SUBMITTED FOR
THE DEGREE OF DOCTOR OF SCIENCE

ON SOME PHENOMENA OF INTERACTION OF ELECTROMAGNETIC FIELDS WITH MOVING ELECTRICALLY CONDUCTING FLUIDS WITH APPLICATION TO BIOLOGICAL FLOWMETRY: A CRITICAL STUDY

by CLIFFORD DURAS FERRIS*

I. INTRODUCTION

A currently important medical and physiological problem is the accurate measurement of blood velocity and blood volume flow rate within human and animal blood vessels. Ability to make such measurements has increased in importance with the development and use of artificial organs as a relatively routine surgical procedure. A human life can depend upon the accuracy with which blood flow through an artificial organ is controlled and measured. Until recently, blood flow velocity determinations depended upon rather crude mechanical devices. Measurement was a slow process and could be dangerous to the patient or bring about undesirable metabolic changes. Direct mechanical measuring techniques invariably required severing of a blood vessel and insertion of a cannula or other device in order to attach the flow measuring instrument. Such processes grossly disturb the hydrodynamic system represented by the network of veins and arteries filled with flowing blood. Measurement accuracy was frequently marginal.

It was not until 1935 that indirect techniques evolved. Wetterer in Germany, and Kolin in the United States independently made use of a physical law—Faraday's Law—to develop an electrically based instrument designed to give a direct indication of *in vivo* blood flow velocity. The device which they developed still required surgical exposure of a blood vessel but removed the necessity of severing an artery or vein.

During the twenty years which followed Wetterer's and Kolin's initial experimentation, two other promising devices evolved for blood flow measurement. In the 1940's, the ultrasonic flowmeter appeared, developed by Kalmus, and in the 1950's, Singer published an account of a nuclear magnetic resonance device for measuring blood flow.

The advantage of these three devices lies in their operation. They are electrically operated and may be used with intact blood vessels. In addition, the nuclear magnetic device may be operated without the need to expose a blood vessel. By 1960, these three devices had been used experimentally for blood flow measurements,

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* B.S. in E.E. 1957, M.S. in E.E. 1958, University of Pennsylvania; D.Sc. conferred February 22, 1962. Professor in charge of research: Nelson Thomas Grisamore, *Professor of Electrical Engineering.*

but none had been adopted for routine use. Difficulties existed with respect to calibration, drift of zero reference, and repeatability of measurement. These various difficulties resolved themselves into one fact. No clear physical theory had been presented for any of the instruments. In certain cases, theory had been woven to fit experimental observations. Various theories existed but in many cases, they were incomplete, inconsistent, or inaccurate. Definitive error analyses were entirely lacking. Little attempt was made to examine the effect of a given device upon the biological system to which it was attached.

The work reported here presents the complete physical theory for each of the three devices and, in addition, two new instruments are presented. While the new devices are not appropriate for accurate blood flow measurement, one provides a means for observing directly a dipole orientation phenomenon which in the past has been detected by indirect means only. In addition, a detailed error anlaysis is carried out for each device from a physical standpoint as well as the effect of the device upon an associated biological system.

II. THEORY

One may postulate the requirements which a clinically useful blood flowmeter must meet as follows: (1) use of the flowmeter must not be detected by the metabolism of the animal or human to which the flowmeter is applied; (2) use of the device should in no way disturb normal blood flow; (3) it must be convenient to use, portable, and not require continued balancing for zero drift or calibration; (4) it must be capable either of measuring volume flow directly in cubic centimeters per second or of measuring fluid velocities in the range from 1 cm/sec to 100 cm/sec; and (5) the cost of the device should be minimal.

Based upon the five criteria set forth above, one may eliminate mechanical, thermal, optical, and radioactive-tracer flowmeter techniques. Electromagnetic and electroacoustic techniques remain. In order to understand the problems involved in designing a flowmeter based upon electromagnetic or acoustic phenomena, it is first necessary to examine the nature of blood flow in the circulatory system of an animal. Various experiments have been carried out which indicate that laminar flow occurs in human and animal aortae. One may then make theoretical extensions from this result to show that laminar flow may be assumed for the circulatory system as a whole.

Blood circulation may be characterized hydrodynamically as pulsatile flow of a nonideal fluid through distensible tubes. The pulsatile nature of the flow is brought about by the pumping action of the heart. Blood vessels possess elastomeric walls which expand with each pressure pulse and contract after its passage. If a blood vessel is constrained mechanically, various hydrodynamic complications may occur. Hence one must examine the effects of inserting cannulas into blood vessels or constraining them by ligatures. In addition to the various properties of the blood vessels, it is necessary to examine blood itself. Blood is a nonideal fluid. It is composed primarily of erythrocytes (red blood cells) suspended in a fluid serum. The red cells are bi-concave discoidal particles which are not uniformly distributed throughout the suspending fluid. The density of blood is substantially less at the vessel walls than its value at the center of a vessel. This distribution of the red

cells produces some definite electrical and electroacoustic properties of the blood as well as some peculiar hydrodynamic properties. All of these properties must be considered in the design of a flow measuring instrument.

III. ELECTROACOUSTIC FLOWMETER

It is possible to build a device to measure blood flow which operates on an acoustic principle. If one clamps two piezoelectric transducers, separated by a short distance, to the outside of a tube which carries a moving fluid, then the velocity of the fluid may be determined by measuring the time required for a sonic pulse to travel between the two transducers under two conditions: (1) the sonic pulse moves with the flow and (2) the sonic pulse moves against the flow. The accuracy of the velocity determination is improved as the separation of the transducers is increased. Other limitations, however, are imposed in biological systems which require the transducers to be placed relatively close together. Two such limitations are physical length of blood vessels and absorption of acoustic energy by blood. When low fluid velocities exist within the tube, these limitations impose the necessity for measuring very small transit time differences. Some instruments are designed to measure time difference in terms of electrical phase shift. In either case, ultrasonic flowmeters are limited for biological use to the measurement of flow velocities above 10 cm/sec. The time differences which occur for lower flow velocities are too small to be measured accurately with currently available techniques. This is a serious limitation upon the device. In addition, nearly all ultrasonic flowmeters require the use of a cannula, which means that a vessel must be severed so that the cannula may be inserted. Insertion of a cannula disturbs the biological system as well as the hydrodynamic processes involved.

IV. ELECTROMAGNETIC FLOWMETER

This device is based upon Faraday's Law which states that an electromotive force may be produced in a conductor which is moved relative to a magnetic field. It can be shown that the emf is proportional to the velocity of the conductor. Since blood is electrically conducting, one may use blood flowing in a vessel as the moving conductor. If the blood vessel is located in a magnetic field, then an emf which is proportional to blood velocity may be detected by placing electrodes on either side of the blood vessel. The correct theory for the operation of the device is based upon Maxwell's curl equations for the relativistic condition of a conducting medium in motion relative to a spatially fixed magnetic field. In this manner, an expression is developed for the measured emf in terms of the velocity and the electrical properties of the blood. Earlier theories employed a simplified form of Maxwell's equations which produced an expression for emf which was independent of the electrical properties of blood. This led to the inconsistency that a perfect insulator should produce the same potential as a perfect conductor.

Electrode polarization phenomena are examined with respect to the emf pickup electrodes and the voltage sensing circuits connected to them. Additional effects are considered such as transverse magnetohydrodynamic waves initiated by the conducting fluid (blood) moving relative to a high-field-strength magnetic field. MHD waves destroy the axial symmetry of the assumed laminar flow. This has a marked effect

upon the sensitivity and accuracy of electromagnetic flowmeters as the electric potential distribution within the fluid is distorted.

V. NUCLEAR MAGNETIC RESONANCE FLOWMETER

Nuclear magnetic resonance may be used as a technique for measuring blood flow. The hydrogen nuclei of the water component of whole blood are the observed quantities. Nuclear magnetic resonance can be observed in a material which is placed in a crossed radio-frequency and magnetic field. If the frequency of the r-f energy is adjusted to equal the Larmor frequency for the hydrogen nuclei at a given magnetic field strength, then magnetic resonance occurs. Resonance may be detected as a sharp rise in the absorption of r-f energy by the sample. A finite time is required for the nuclei to change from a nonexcited to resonance condition. The amplitude of the r-f absorption is proportional to the quantity of nuclei which have been excited to resonance. If the sample is in motion, such as flowing blood, the amplitude of the r-f absorption curve will change in a manner proportional to the fluid velocity. In this manner a very accurate flowmeter may be developed.

The possibility of magnetohydrodynamic waves again exists, but such waves do not seriously affect the accuracy of the instrument. Nuclear magnetic resonance flowmeters produce an output signal which is proportional to the volume concentration of excited nuclei. This signal is not strongly dependent upon the velocity profile of the fluid flow.

A more sensitive indication of resonance absorption is provided by the use of electron paramagnetic resonance. EPR, however, occurs for most samples in the kilomegacycle range while NMR occurs in the 1 — 40 mc range. The instrumentation required for EPR determinations is extremely complex in comparison to that which is suitable for NMR measurements. For this reason, blood flowmeters utilize the NMR principle even though signal-to-noise ratios are lower than those obtainable with EPR.

It is possible to measure volume blood flow by NMR techniques without exposing a blood vessel. This is a distinct advantage over all other techniques. One first determines absorption in a finger, for example, in which blood flow has been momentarily halted by means of a tourniquet. Normal blood flow is then restored and the absorption remeasured. The difference in the two absorption readings can be used to determine the volume blood flow. At present, this method yields low accuracy but holds promise for the future.

VI. DIELECTRIC INCREMENT FLOWMETER

Two other electrical phenomena are examined for possible application to flowmetry. It is known that when a dielectric is moved relative to a magnetic field an emf appears across the dielectric. It would seem possible that a flowmeter could be constructed using this principle. Although blood is an electrolyte, it possesses strong dielectric qualities. It is shown, however, that the polarization current effect is too small to be measured.

Another effect is dipole orientation in a high frequency electric field. The dielectric constant of a fluid will change slightly as a function of the volume concentration of oriented dipoles, provided that the fluid contains polar molecules or

particles into which a dipole moment may be induced. Blood is such a fluid. It should then be possible to build a flowmeter which is somewhat analogous to the nuclear magnetic resonance flowmeter, but which operates on the absorption of electromagnetic energy as a function of the dielectric constant of the fluid. The volume concentration of oriented dipoles should change with changes in fluid velocity. Such a device was constructed. The indicated effect was observable, but was so small that it was almost buried in system noise. One is thus forced to conclude that it is not practical to build a flowmeter based on this phenomenon. Difficulty was also experienced with air bubbles in the fluid stream. Even a few minute air bubbles were capable of changing the permittivity of the sample sufficiently such that the orientation effect was completely masked.

Although the experiment did not lead to a practical device, it is interesting to note that this was the first time that the orientation was observed by a direct method. Usual techniques postulate the orientation based upon the behavior of the relative permittivity and conductivity of an electrolyte as a function of frequency.

VII. DISCUSSION AND CONCLUSIONS

The theory of operation of several blood flowmeters is developed based upon the physical, hydrodynamic, and biological principles involved. Since the devices depend upon the interaction of a moving conducting fluid and electric, magnetic, or acoustic fields, detailed examination of the pertinent properties of the fluid must be undertaken. In addition one must study the mechanism of interaction of an electrolyte in motion relative to various crossed field configurations. Such a study leads to some particularly interesting results, such as the initiation of magnetohydrodynamic waves, which one is inclined to overlook in the development of a simple device or a simplified theory.

In view of the five operating criteria set forth for blood flowmeters, it can be stated that the nuclear magnetic resonance device alone is satisfactory. It is by no means the ideal instrument, but it holds definite promise. The theory of operation of the device appears firmly established. Technological refinements are required and the author is currently continuing this work.

It should be observed that, while the discussion in this dissertation pertains to blood flow measurements explicitly, the techniques involved may be used for any conducting fluid and, in the case of the ultrasonic flowmeter, for any fluid which has a velocity greater than 10 cm/sec. Electromagnetic flowmeters have been used to measure the flow of liquid sodium in nuclear reactors.

SUMMARIES OF DISSERTATIONS
SUBMITTED FOR
THE DEGREE OF DOCTOR OF EDUCATION

CHANGING EXPECTATIONS FOR THE AMERICAN ELEMENTARY SCHOOL TEACHER: SELECTED TEACHING ABILITY REQUIREMENTS AS REVEALED BY AN ANALYSIS OF STATE COURSES OF STUDY, 1930-1961

by ROBERT EDWARD BAKER*

PURPOSES

This study was made in an attempt to identify changes which have taken place since 1930 in expectations for the American elementary school teacher in selected areas of teaching ability, by analyzing the stated and implied requirements of state courses of study. The study was designed to make a contribution to the continuing chain of attempts to pursue teacher excellence through increasing the effectiveness of teacher education which have marked the history of teacher education in the United States of America.

Specifically, it sought to gather information which might be helpful to teacher educators in answering the question, "What do American elementary school teachers need to be able to do?" To this end, the study proposed to analyze the elementary school courses of study which have been in use in each of the United States of America for the greatest number of years during the periods 1930–1939, 1940–1949, and 1950–1961 in search of answers to the following questions:

1. What are the subject-matter areas which the American elementary school teachers have most often been expected to teach?
2. In these subject-matter areas, what have been some of the most commonly stated or implied expectations for teachers in the content of the courses of study?
3. Have there been changes in these expectations in the period 1930–1961, implying the necessity for changes in the curricula for teacher education?
4. What are some of the implications for current teacher education in the United States from state courses of study in use at the present time?

METHODS OF PROCEDURE

This study involved bibliographic research, primarily. The chief elements of concern, therefore, were attainment of as complete a coverage of available sources as possible, application of consistent and reasonable methods of analysis, and judicious interpretation of facts revealed. The solution to these problems was approached through the following procedures:

* B.S. in Ed. 1939, State University of New York, College of Education at Buffalo; A.M. 1954, Catholic University of America; A.M. in Ed. 1956, The George Washington University; Ed.D. conferred February 22, 1962. Professor in charge of research: Anthony Charles LaBue, *Professor of Education*.

1. The courses of study in reading, arithmetic, social studies, language, spelling, and handwriting which were in use in each of the states for the greatest number of years during each of the periods 1930–1939, 1940–1949, and 1950–1961 were identified by (1) direct inquiry of the chief state school officers, (2) inquiry of the state representatives to the Board of Directors of the Association for Supervision and Curriculum Development, and (3) examination of the course of study collections in the United States Office of Education Library, the Library of Congress, and the National Education Association Library. Seven hundred and twenty-six courses of study were identified by these methods.

2. An attempt was made to obtain as many as possible of the identified courses of study for analysis, by using the following resources in the order cited: (1) the United States Office of Education Library, (2) other local library sources, (3) loans from the Departments of Education in certain states, and (4) loans from members of the teaching profession in certain states who were located through the Association for Supervision and Curriculum Development. Seven hundred and eleven courses of study, 97.9 per cent of those identified, were obtained.

3. The courses of study thus obtained which contained information concerning the complete elementary school program of studies being carried on in their state at the time of publication were analyzed to determine (1) the number of subjects and (2) the specific subjects which elementary school teachers were expected to be prepared to teach. This information was further analyzed to reveal (1) the average number of subjects an elementary school teacher was expected to teach in each period, (2) the per cent of teachers serving under the courses of study analyzed who were expected to be able to teach each subject, and (3) the specific subjects an elementary school teacher was most likely to be required to teach in a given period.

4. All of the courses of study obtained were examined, and, for each, the following information was reported on index cards: (1) the number of stated purposes for instruction which were identified as falling in each of the following selected categories: skills or abilities; habits; understandings or concepts; knowledge, facts, and experiences; and attitudes, appreciations, and interests and (2) a brief descriptive statement concerning the stated or implied expectation for the teacher in each of the selected instructional areas of planning, class organization, teaching methods, and evaluation.

5. The information thus recorded was checked, and consolidated when similar expectations were identified in two or more states during the same period.

6. From the recorded data, the following computations were made in each subject matter area, for each period: (1) the average number of stated instructional purposes per teacher serving under analyzed courses of study in each period which were identified in each selected category, (2) the per cent of all purposes falling in each category, (3) the per cent of teachers having each identified expectation for planning, class organization, teaching methods, and evaluation.

7. The resulting figures were tabulated and studied to attempt to identify changes in expectations for elementary school teachers which have taken place

since 1930 and current conditions which affect the majority of teachers.

8. Implications for present and future teacher education were projected from the identified changes and expectations most commonly found in the courses of study which are in use at the present time.

REVIEW OF THE LITERATURE

The literature pertinent to this dissertation is that dealing with teacher *competencies*, the ability of teachers to do things, rather than the broader field of teacher *competence*, the effectiveness of teachers, of which it is a part. A careful and intensive search failed to disclose any previous study which was similar in specific purpose, content, or approach. The results of a 1953 questionnaire study emphasized the pertinence of curriculum trends in the elementary schools to programs for the preparation of teachers.

There have been four major studies in the general area of teacher competency. The Commonwealth Teacher Training Study, 1929, compiled a list of specific teacher activities running to 12,000 items. A. S. Barr, in 1948, summarized 32 studies and identified 4 roles of the teacher and 18 teacher competencies with which they dealt. The Commission on Teacher Education of the California Teachers Association, through interviews and study groups, formulated a definition of teacher competence in terms of 6 roles of the teacher, each explained by behavioral descriptions of what the teacher should be able to do. This has come to be the most generally accepted basic definition of teacher competencies. This group published reports in 1952 and 1957. The National Commission on Teacher Education and Professional Standards of the National Education Association adopted the definition of the California Commission and continued to refine it in terms of more exact behavioral descriptions through study groups throughout the country and meetings at three national conferences. Reports were published in 1953, 1954, and 1955.

The latest reviews of literature in this area are found in the *Encyclopedia of Educational Research* and the June 1960 *Review of Educational Research*.

Two important studies which have pertinence to the subject are being carried on by departments of the National Education Association and published results are expected in the near future.

THE FINDINGS

Purposes.—The analysis of categories of purposes within each subject-matter field yielded the following information:

1. Large numbers of purposes, varying from an average of 53.07 to an average of 127.72 per teacher, were stated in courses of study for reading, arithmetic, social studies, and language. In reading and arithmetic the number has remained about the same through the time of the study. In social studies there has been a small net decrease. In language there has been a large net increase.

2. Small numbers of fairly definite purposes, from 8.42 to 15.57 on the average, have been stated in courses of study in spelling and handwriting. In each instance, there has been a net increase in the number of purposes since 1930.

3. In reading, arithmetic, language, spelling, and handwriting at least a majority of all stated purposes have been skills. In reading and language this emphasis has tended to increase over the thirty year period. The emphasis has remained about the same in arithmetic and spelling. There has been a slight decrease in the emphasis upon skills in handwriting.

4. In social studies, the major emphasis is about equally divided between knowledge and understandings in the current period. This reflects an increase in the first category and a decrease in the second over the years of the study.

5. An important growth in emphasis upon concepts in arithmetic was noted.

6. Over the years covered by the study, there has been a continuous decrease in emphasis upon habit formations, except in handwriting, in which habits are an important and growing category of purposes.

Major expectations.—The study revealed relatively few expectations which have applied to more than 50 per cent of teachers working under the state courses of study for the 1950–1961 period which were obtained and analyzed. These were:

1. Elementary school teachers were expected to plan work for the accomplishment of specific attainments listed in courses of study in reading, arithmetic, and language.

2. A basal reading series was to be used as the organizing center for planning and methods in reading.

3. Unit planning was expected in the social studies.

4. Teachers were to use the course of study as a source of help in planning for teaching social studies.

5. Cooperative planning with the children for teaching social studies was an expectation for a majority of teachers.

6. The textbook was to be the basis for the planning of the teaching of spelling.

7. Intra-class grouping was the expected organization for instruction in reading, arithmetic, social studies, and language. There was also the possibility that it might be employed by a majority of teachers in spelling and handwriting if those permitted choices of grouping by their courses of study elected to use this organization.

8. In handwriting, individualized instruction was expected.

9. A majority of teachers were expected to teach phonics as a part of their reading instruction.

10. The course of study was an important source of help in teaching methods in arithmetic, social studies, language, spelling, and handwriting.

11. The basic expected method for social studies and language teaching was the guidance of pupil activities.

12. A formal, direct approach was expected in handwriting.

13. The ability to use standardized testing was expected in reading, arithmetic, and handwriting.

Consistent trends.—A number of consistent trends were noted, which, although they have not yet become expectations for a majority of teachers, have implications for teacher education, since they will soon attain this position of major importance if the observed rate of growth continues. They are:

1. Teachers are coming to be expected to plan with attention to the needs of children in all six of the subject matter areas studied.

2. The importance of the textbook is declining in all of the subject fields, although it is still of major importance in reading and spelling.

3. Courses of study are giving up the inclusion of a detailed outline of content to be covered, in all of the subject matter fields.

4. Greater numbers of different evaluation techniques are being expected in all of the subject matter fields.

5. There is a trend toward expecting that teachers will guide their children in self-evaluation in reading, arithmetic, social studies, language, and handwriting. This expectation has increased in spelling since 1930, but there has been a decrease from 1940–1949 to 1950–1961.

6. More and more teachers are being expected to develop individual word lists from the writing needs of their children as a supplement to a basic required list in their teaching of spelling.

7. There is a trend toward diversity of expectations for spelling methods.

8. There is a divided trend in the area of testing. Fewer teachers are being expected to use testing as a part of their evaluation in reading, social studies, spelling, and handwriting, although testing is still important in reading and handwriting. In arithmetic and language an increased expectation for testing was noted.

Freedom of choice.—The judgments concerning degree of freedom of choice given in planning and methods disclosed the following trends and present conditions:

1. A definite trend over the thirty-year period toward increased freedom of choice in both planning and methods was found in all six of the subject matter fields studied.

2. A rather pronounced trend toward giving only partial freedom instead of great freedom in arithmetic methods was noted.

3. A condition of partial freedom of choice, in which choices were allowed among a number of specified planning forms or teaching methods, or in which other requirements of the courses of study placed limitations upon the teacher's freedom of choice, existed for a majority of teachers in planning for reading, arithmetic, social studies, and language, and in teaching methods in arithmetic, social studies, and language.

4. Little freedom was given a majority of teachers in methods of teaching reading and handwriting, the basal reader approach and direct, formal teaching in handwriting usually being required.

5. In planning for spelling and handwriting, approximately equal minority groups were given partial and great freedom of choice.

6. In methods of teaching spelling, approximately equal minority groups were given partial and little freedom of choice.

Amount of help.—The judgments concerning the amount of help given teachers in planning and methods revealed the following trends and conditions existing in the 1950–1961 period:

1. There was an identified trend toward the expectation that teachers would

have to draw upon personal professional resources in both planning and teaching methods, since state courses of study gave little or only partial help in these responsibilities, in all six of the subject matter fields studied.

2. A majority of teachers in the 1950–1961 period served under language courses of study which gave little help in planning, few or no suggestions being made in the course of study, and no references being made to sources of outside help.

3. Partial help, with suggestions or referrals in the course of study expected to be augmented by the personal resources of the teachers, was given a majority of teachers in planning for arithmetic, social studies, spelling, and handwriting, and in methods in social studies and language.

4. 1950–1961 courses of study supplied a majority of teachers with much help in methods of teaching arithmetic and handwriting, giving rather exact explanations of how the material in these fields was to be taught.

5. Approximately equal minority groups were given little and partial help in planning for reading and methods of teaching spelling.

6. Approximately equal minority groups were given partial and much help in reading methods.

IMPLICATIONS FOR TEACHER EDUCATION

In the light of the summarized findings, it seems justified to propose the following implications for teacher education:

1. State courses of study should be considered as one important source of possible purposes by those planning curricula for teacher education.

2. Teacher education institutions should reflect in their programs the fact that the major instructional role of the elementary school teacher is that of a developer of skills and abilities.

3. In preparation for teaching the social studies, teacher education institutions should strive to awaken their students to the realization of a dual responsibility in this field: (1) the need to teach thoroughly a body of social studies knowledge—facts and information—in such a way that it will be retained and applied, and (2) the need to develop comprehension of a body of understandings and concepts concerning man in relation to his physical and social environment.

4. In preparing students for teaching arithmetic, increasing attention should be paid to concept formation as an integral part of the learning in this field.

5. Teacher educators should accept the responsibility of providing programs which will prepare beginning teachers to meet the relatively few specific major expectations identified by this study.

6. Expectations which have been identified as consistent trends should be observed closely by teacher education planners, and the desirability of making provision for them should be considered as curriculum development proceeds.

7. The consistent trend toward increased freedom of choice in planning and teaching methods implies that teacher education should have a major concern for the development of a thinking professional individual, whose unique pattern

of aptitudes can be utilized in the most effective manner for meeting the needs of individuals and of society.

8. The consistent trend toward reduced amounts of help in planning and methods in courses of study, combined with the large number of purposes which it is expected that teachers will meet, demonstrates the necessity that teacher education continue to maintain and improve programs of professional education.

9. The findings that the usual situation for teachers is one in which partial freedom and help are given in planning and methods, and the occasional condition of little help being afforded, suggest the implication that teacher education institutions should prepare their graduates efficiently to utilize the direction and assistance which is available to them in courses of study and other professional materials to amplify their own abilities in terms of the needs of their situation.

AN EVALUATION OF SUPERVISION OF VOLUNTEER LEADERS IN TENNESSEE 4-H CLUB WORK

by GEORGE SAMUEL FOSTER*

THE PROBLEM

The purpose of this study was to obtain information that might lead to improved supervision of volunteer leaders in Tennessee 4-H Club work. Specifically, the study sought answers to the following broad questions: (1) to what extent has participation in the program, "Tennessee 4-H Club Leadership in Depth", affected the time devoted by county extension agents to volunteer 4-H Club leaders and agents' effectiveness in both 4-H Club and other extension work? (2) what supervisory functions are performed by county extension agents? (3) what difficulties do extension agents face in carrying out the phase of their assignment that relates to the supervision of volunteer 4-H Club leaders? (4) what preparation have extension agents had for the phase of their present assignments relating to the supervision of volunteer 4-H Club leaders? (5) what are acceptable criteria for supervision of volunteer leaders in 4-H Club work? (6) to what extent have supervisory practices sat-

* B.S. in Agr. Ed. 1943, University of Tennessee; A.M. in Ed. 1948, The George Washington University; Ed.D. conferred February 22, 1962. Professor in charge of research: James Harold Fox, *Professor of Education*.

isfied the criteria of good supervision? (7) how can supervision of volunteer leaders be improved?

Supervision, as the term is used in this study, is a process by which volunteer leaders are helped to greater competency and growth as individuals and as educational leaders.

PROCEDURE

An original draft of criteria and practices was developed from the literature. The following list of criteria was submitted for validation to a panel of federal extension and state 4-H Club personnel with special competencies in this area.

1. Supervision is a *purposeful* activity.
2. Supervision *organizes* human activity efficiently.
3. Supervision is an *individualized* activity.
4. Supervision is a *cooperative* activity.
5. Supervision is concerned with the *self-directed improvement* of leaders.
6. Supervision is a self-directed *growth-like* process.
7. Supervision is an *evaluative* activity.
8. Supervision is a *learning* process.
9. Supervision demonstrates a desire to be of assistance to the leader *personally* and *in his leader role.*

All nine criteria were accepted by more than three-fourths of the panel members. A questionnaire, containing the list of practices, based on criteria was prepared and sent to the panel members who were asked to rate the supervisory practices as to importance. Fifty-six practices were rated very important by more than half of the panel members and were therefore retained in the study.

Performance data were collected by mail questionnaire from all extension agents in Tennessee with three or more years of county extension experience prior to July 1, 1961. The questionnaires used in the study consisted of two parts. Form 1 asked for background information on the agents. Form 2 consisted of the list of supervisory practices. These statewide data were summarized to indicate the current supervisory situation as county extension agents see it. Further analyses were made comparing agents' rating by categories based on their participation in "Agent Training and Refresher Conferences in Leadership in Depth", and panel rating of the importance of the 56 supervisory practices. The training and refresher conferences were in-service education methods by which professional extension agents were prepared to train and supervise volunteer 4-H Club leaders. The number of such conferences in which agents had participated varied from a minimum of none to a maximum of three per agent.

REVIEW OF THE LITERATURE

The literature was carefully reviewed as a source of information related to criteria and practices of supervision of volunteer leaders. Three sources proved most helpful: (1) literature related to volunteer 4-H Club leaders, (2) writings on supervision of volunteers in other organizations, (3) relevant material dealing with supervision of professional staff of extension and other related groups such as teachers.

The literature and correspondence with national professional workers in organi-

zations and agencies which rely on volunteers revealed much interest in the subject and a considerable body of related information.

RESULTS OF THE STUDY

The results of this study may be summarized as follows: Tennessee county extension agents' performance does not measure up to their knowledge of effective supervisory practices. All categories of agents accepted the nine criteria of effective supervision of leaders. In general, they concurred with panel members' judgment as to the most important supervisory practices. A majority of the agents performed every practice validated by the panel and considered all but two of "average" importance or "very" important. However, their own judgment of their performance indicates that their achievement fell short of their aspirations.

An analysis, based on participation in "Leadership in Depth" conferences, of the agent's evaluation showed that:

1. More than half of the agents who did not attend a training conference, in counties not involved in the program, considered their performance of only eight of the practices wholly or partially adequate. However, *no* practice was used to this extent by 75 per cent or more of these agents. Conversely, 22 practices were used to "some" degree or "adequately" by less than 25 per cent of the agents in this group.

2. A majority of the agents, attending no training conference, in counties involved in "Leadership in Depth" performed *no* practice to "some" degree or "adequately". At the opposite end of the spectrum, *41* practices were used to "some" degree or "adequately" by less than 25 per cent of the agents in this group.

3. Only *one* practice was performed to "some" degree or "adequately" by 75 per cent or more of the agents, attending one training conference, in counties involved in "Leadership in Depth". On the other hand, *six* practices were used to "some" degree or "adequately" by less than 25 per cent of the agents in this group.

4. *Eight* practices were performed to "some" degree or "adequately" by 75 per cent or more of the agents, attending two training conferences, in counties involved in "Leadership in Depth." *Five* practices were used to "some" degree or "adequately" by less than 25 per cent of these agents.

5. *Twenty* practices were performed to "some" degree or "adequately" by 75 per cent or more of the agents, attending three training conferences, in counties involved in "Leadership in Depth". On the other hand, only *four* practices were performed to "some" degree or "adequately" by less than 25 per cent of the agents in this group.

CONCLUSIONS

The findings of the study imply the following conclusions:

1. The time agents devote to leaders varies widely. It has increased since "Leadership in Depth" was initiated, and the increase has been greater among agents attending more "Training and Refresher Conferences". "Leadership in Depth" increased agent effectiveness in both 4-H Club and other extension work.

2. The majority of Tennessee agents feel a professional responsibility for a broad range of functions related to 4-H leaders. They perform all functions to

"some" extent; but they did not feel any specific function was of much importance in their work.

3. No problems related to leaders are considered very difficult to solve by a majority of Tennessee agents. Apparently many agents haven't found the problems difficult because they haven't tried to solve them. The two problems viewed as most difficult to solve may be overcome by continual, systematic agent training in and increased time devoted to leader supervision.

4. Most agents have done some graduate work and participated in a wide variety of other in-service education activities. However, a minority of agents considered most in-service education activities "very" helpful; but those agents who had participated in two "Leadership in Depth" activities considered them of much help.

5. The same general criteria are acceptable for leader supervision as for supervision of agents. There was general acceptance of all nine criteria by both the panel and agents. The closest agreement on criteria existed between the panel and those agents with the most experience in "Training and Refresher Conferences" and in helping to conduct basic courses in "Leadership in Depth."

6. All the practices validated by the panel were performed by most agents. The adequacy of the performance of most agents leaves much room for improvement. However, the adequacy of performance seems to increase with increased training and refresher experiences related to leader supervision.

7. There is room for improvement in supervisory practices related to each criterion. Improvement of practices is accomplished by continued, specific, systematic training of agents and more time devoted to leader supervision. Most agents who use follow-up methods recommended in "Leadership in Depth" have found them useful.

IMPLICATIONS FOR ACTION

1. Leader effectiveness would be increased if agents devoted more time to training. On the whole, agents reporting the greatest increase in time devoted to leaders also reported the greatest increase in effectiveness. Most agents devoted considerably less time to leaders than was given by agents in the most effective category. The agents in the most effective category reported only 11-60 days each of their 280 work days devoted to leaders during the year.

Participating in "Training and Refresher Conferences" and helping in conducting basic leader courses have been the most helpful in-service education activities to date for those agents devoting the most time to leaders and indicating greatest effectiveness in their work. Therefore, continued emphasis on these two annual activities for all agents expected to devote any time to leaders seems justified. The findings also suggest the need for careful planning of subsequent conferences to meet the changing needs of agents.

2. Continuing attention to the following points is needed: (1) detailed job descriptions for each agent's work in leader supervision, prepared jointly by agents and their supervisors; (2) clarification of the functions of each agent in leader supervision as related to other agents in the county. This process should clarify shared responsibilities which have seemed to cause some confusion in the past.

3. As increased time and attention is given to leader supervision, and as functions are clarified, more rather than fewer difficulties may be recognized. Continual, specific, systematic training and refresher experiences for both agents and leaders appear to offer the best means to cope with new problems that are recognized as 4-H Club programs come to grips with more fundamental concerns of people.

4. There is a need for: (1) including in the present in-service training activities more specific preparation for leader supervision and/or making new activities of this type available; (2) encouraging agents to avail themselves of more opportunities for professional improvement provided by other organizations and agencies in the field of leadership training and supervision; and (3) providing the opportunity for all agents expected to train and supervise leaders to participate in regular training and refresher conferences, help conduct regular training and refresher experiences for leaders, and receive individual help as needed.

5. The concept of basing leader supervision on basic criteria of effective supervision provides agents with a new approach to the job of supervisor. These criteria provide agents a basis for planning, executing, and evaluating their supervisory programs. If the agent can be given regular, systematic training and refresher experiences designed to meet changing demands of the job, he should get a clearer concept of accepted criteria and the appropriate place of leader supervision in his work. As a result he should be able to apply his limited time more effectively.

6. The results of this study suggest action is needed to: (1) provide opportunity for all agents, expected to supervise leaders, to become more familiar with all the "very important" practices; (2) help agents discriminate between the practices related to each function which are of "some" importance and those of most importance; (3) help agents develop realistic standards of performance as a basis for measuring the adequacy of their performance; and (4) continue exploration of other practices needed.

7. In addition to the implications discussed in connection with other findings, the following are suggested: (1) encourage agents to continually evaluate their progress and programs; (2) emphasize in agent training the "why" as well as the "how" of practices; (3) provide regular, specific, and systematic basic training for new leaders coupled with follow-up and refresher experiences for experienced leaders in each county; and (4) continue experimentation with new practices which seem promising, based on research and experience.

FURTHER RESEARCH

As this study was conducted, a number of other needs for studies emerged. Some of the areas in which research appears to be most needed are:

1. Objective studies to determine the effectiveness of volunteer leaders who have been trained and supervised by agents who use the practices advocated in this study.

2. Periodical evaluations similar to the present one.

3. Research to compare the concepts of extension supervisors with those of local agents.

CONCLUDING STATEMENT

This study attempted to answer some questions concerning the supervision of 4-H Club voluntary lay leaders. Some of these questions have been conclusively answered as far as the State of Tennessee is concerned; others have not. It is hoped that this study marks some progress in our understanding of how to use lay leaders effectively.

THE PARENT-TEACHER CONFERENCE: AN ANALYSIS OF SELECTED CONFERENCE PROBLEMS

by MARCELLA SIEGEL BERNSTEIN*

THE PROBLEM

Professional literature abounds with material which indicates the desirability of affirmative home-school relationships. Scientific study of child development has placed new and complex responsibilities on parents, teachers, and community services. However, despite abundant affirmation of the need for productive home-school relationships one of the principal devices for exchange between the home and school —the parent-teacher conference—has received very little specific study.

The purpose of this study was to attempt to learn as precisely as possible what teachers in Montgomery County say are their problems with relation to parent-teacher conferences and to relate what they say to selected factors such as grade assignment, experience, age, sex, marital status, education, the teacher's self image, and number of conferences held in the past year.

The study directs attention to problems related to: (1) interview skills, (2) skills which are outgrowths of personal maturity, and (3) skills which would reflect the teacher's professional training.

PROCEDURE

The study population was made up of 1,700 elementary school teachers in Montgomery County, all of whom were invited to participate in a survey on Parent-Teacher Conferences; 1,250 responded, a return of 73 per cent. The survey was a

* B.S. in Ed. 1934, Johns Hopkins University; A.M. 1949, American University; Ed.D. conferred June 6, 1962. Professor in charge of research: Anthony Charles LaBue, *Professor of Education.*

two-part questionnaire including a background factor sheet which elicited personal data and a questionnaire which required the teacher to rate as "no problem," "mildly difficult," or "very difficult" 54 items which make up the conference complex. These items were identified by asking many teachers what they thought were important factors in the parent-teacher conference and by reviewing the literature.

Participation in the study was voluntary and anonymity of responses was safeguarded. Principals of schools were informed of the survey but had no part in the distribution or collection of the material.

Analysis of the data included the following steps:

1. Items on the conference questionnaire were classified, with the help of a jury, into three categories, those requiring interview skills, personal maturity, or professional competence.

2. For each item of background data, "Age," "Experience," and the like, responses to each of the three categories, Interview Skills, Personal Maturity, and Professional Competence were analyzed. Each respondent was given a score for each answer; "zero" for the rating of "No Problem" and a score of "one" for the rating of "Mildly Difficult" or "Very Difficult." Scores for each subsection were added to secure totals. Low scores indicate less problem. High scores mean that teachers considered the items in the subsection "Mildly Difficult" or "Very Difficult."

3. Scores were added and averaged in order to compare mean scores among criterion groups which were sub-groups of teachers classified by education, experience, sex, grade assignment, and the like.

4. Items which make up the conference complex were arranged in rank order of difficulty for each of the subsections, Interview Skills, Personal Maturity, and Professional Competence.

5. Items judged "Very Difficult" by most teachers were analyzed in terms of relevant background factors.

6. An attempt was made to show how selected background factors like "number of conferences held" and "grade assignment" were related to one another.

REVIEW OF THE LITERATURE

Search of the literature in education revealed little pertinent material on the parent-teacher conference. There are perhaps a dozen books and several score of articles of significance. Statements which encourage good home-school relationships are to be found in the literature on Administration, on Guidance, and in current professional and popular periodicals. However, these sources do not address themselves to the technical aspects of the teacher's role in the interview and do not consider with any specificity the teacher's problems with regard to the entire conference constellation.

For these reasons, literature of Social Work and Psychiatry was explored, a literature deeply concerned with the nature of relationship and, by implication, with the interview which is the setting for the development of the relationship.

Writers in the fields of education, psychology, and social work agree that although the purposes for which interviews are conducted vary from obtaining information to modifying behavior, the central issue remains: the interview must be seen

as a process of interaction between persons. The goal of this process is the establishment of a useful relationship between the participants. Repeatedly stressed is the importance of the relationship for it is in this relationship between two persons that things happen.

Literature which relates to major aspects of the parent-teacher conference was reviewed. These aspects were: (1) development of the concept of the parent-teacher conference, (2) need for conferences, (3) how parents and teachers view one another, and (4) the art of interviewing. Material from the disciplines of psychology and social work suggests that the nature of the interaction between the participants in the interview is central.

Fundamental problems include the difference between what the interviewer means and what his respondent hears, distortions motivated by conscious processes, and limitations of skill in observation and communication. Successful interviewers must appreciate and control their own biases. Frank sincerity is to be preferred over clever manipulation. A comfortable and sound relationship must be established between the two participants if progress is to be made toward the solution of any mutually agreed-upon problem.

Writers who have considered the problem agree that the focus of the parent-teacher conference is not the problems of the family, not the neurotic behavior of any family member, but singly and signally, the school work of the child.

SUMMARY OF THE FINDINGS

The Sample.—Questionnaries were distributed to 1,709 teachers of all grades in 96 elementary schools in Montgomery County. Returns were received from 1,250 or 73 per cent. Fifty responses were discarded, leaving a sample of 1,200.

Among the respondents:

Teaching experience ranged from one to more than 21 years.

93 per cent were women.

76 per cent were under 50 years of age.

75 per cent were married.

54 per cent were parents themselves.

75 per cent considered themselves fairly easygoing.

Response to items in the questionnaire.—All items in the questionnaire elicited responses. The one item which was answered by the entire sample was the one which asked the respondent's sex, and only one teacher failed to answer the item which asked about "getting a conference started." The most omitted items in the conference complex were, in rank order.

1. "The teacher dislikes the child," omitted by 66 (5 per cent) of the teachers.

2. "The teacher is much younger than the parents," omitted by 31 (3 per cent) of the teachers.

3. "The teacher is angry at the child," omitted by 27 (2 per cent) of the teachers.

4. "Ability to interpret a changing curriculum" omitted by 20 (2 per cent) of the teachers.

5. "The teacher must disappoint parents who have college expectations for a child of limited ability," omitted by 20 (2 per cent) of the teachers.

For the first and third items in the list, teachers wrote comments stating that they never dislike a child or are never angry. Among those who did answer, 40 per cent indicate "no problem" with being angry. Such a self image is hardly realistic and suggests a denial of hostility in order to present oneself as totally benign, composed, and loving.

Items judged "Very Difficult".—Each of the items was judged very difficult by some respondents. Five teachers considered "getting a conference started" difficult although this skill was rated as "no problem" by 88 per cent of the respondents. The following in rank order are the items considered "Very Difficult" by most teachers:

1. Handling negative comments so parents will not feel criticized was judged "very difficult" by 497 (41 per cent) of the teachers.

2. Disappointing parents who have college expectations for a child of limited ability was judged "very difficult" by 465 (39 per cent) of the respondents.

3. Holding a conference with parents whose child needs to be cleaner was judged "very difficult" by 415 (35 per cent) of the respondents; with parents of a child who takes others' pencils, money, lunch, was so judged by 392 (33 per cent).

4. The parent takes no responsibility for the child's behavior or attitude toward school was judged "very difficult" by 374 (31 per cent).

5. When one parent blames the other for the child's difficulty, it was considered "very difficult" by 355 (30 per cent) of the respondents.

Interrelationship of background factors.—More than half of the new teachers in the sample had, during their training, no courses in guidance, mental health, group dynamics, counseling, or interviewing. All newly employed teachers in Montgomery County in 1961 were required to have at least a Bachelor's degree. Thus, one finds over 50 per cent of the County's "fully qualified" teachers coming to their jobs with no background specifically directed to training them as professional persons in interpersonal relationships.

Largest number of parent conferences were held by kindergarten teachers who, in Montgomery County, are allowed two days at mid year for these conferences. However, despite official encouragement and released time, 37 per cent of kindergarten teachers had less than 30 parent conferences during the previous school year.

Teachers in suburban schools hold about twice as many parent conferences as do teachers in rural schools.

Scores for total sample.—The mean total score for the 1,200 respondents was 29.90 of a possible 54. A score of 27 or more was made by 65 per cent of the total group, indicating that 780 teachers judge that they would experience difficulty with at least half of the items in the questionnaire. Lowest mean scores (9.50) were made on personal maturity skills; interview skills ranked second (9.94); and highest were the scores on items which were classified under professional competence (10.45).

Scores for criterion groups.—Kindergarten teachers made the lowest mean scores in the over-all conference complex. First grade teachers and teachers for nongraded classes were more comfortable than teachers of other grades. Teachers who hold conferences for all children report less difficulty than those who focus on problems only.

Criterion groups most at risk in parent conferences were:

1. Beginning teachers
2. Teachers on intermediate grades
3. Teachers who consider themselves inclined to worry
4. Nondegree teachers
5. Teachers who have conferences only for problem children

CONCLUSIONS

The findings of the study suggest that high percentages of teachers find many elements of the conference complex difficult to handle. The teacher, as the professional member of the conference, is required to meet a level of confidence that is far beyond the usual social demands. This confidence is not easily achieved; it has to be won. Despite some responses which suggest denial of feeling, teachers' survey judgments make it clear that they appreciate many of the demands of the interview. They recognize that an interview implies not only the physical proximity of two or more persons, but that it requires that all normal channels of communication be open to use. The participants must be able not only to see but to perceive one another, to hear the quality of each other's voices, to understand each other's language.

There is a body of knowledge in psychology and in social casework which could enrich the teacher's preparation, knowledge which would help the teacher understand the conflicting emotions that parents may bring to the interview with the teacher. Teachers can learn that parents can not be open to influence from them in any positive manner until they have expressed their own feelings, that communication is not achieved until an exchange of ideas is made possible.

Although theoretical insights are necessary and could be gained from enriched educational experience, actual conference experience is difficult to achieve during a teacher's training. Consequently, school systems which want their teachers to conduct parent conferences and hope that these interviews will prove useful to children, parents, and teachers *may wish to explore ways and means of providing in-service training for their teachers.*

Many teachers in the sample seem to be unable to acknowledge their own negative feelings of anger, resentment, or dislike. Authorities unanimously agree that such a denial is conducive neither to mental health nor to emotional stability. This was repeatedly emphasized in the literature reviewed. Those teachers who *can* face their own hostility admit that it is most difficult to handle in parent-teacher conferences. Until such time as their training—and the school milieu—insures more realistic percepts and less rigid self-expectations, teachers will be dependent upon others in the professional setting for psychological insights and emotional support. *Some way should be found to offer them such support in a comfortable and dependable fashion.*

Teachers rate as "difficult" items with which they have first-hand experience but which do not reflect on them, items like "The child needs to be cleaner." It is interesting that the lowest scores, indicating *least* problem, were made on the personal maturity items despite the fact that each such item contained an open or implied threat to the teacher. One can hardly escape the conclusion that denial is operating here also when large numbers of teachers allege that it would be "no problem" if

the parent dislikes the teacher. Only mischief can ensue from such denial and pretense of invulnerability. *Teachers need help so that they will be able to acknowledge their fears and negative feelings.* Such acknowledgement enables the teacher to be the master rather than the victim of the feelings and as a consequence enables him to be direct and candid with parents rather than defensive, stilted, and artificial.

Since kindergarten teachers made the lowest scores, scores which indicate the least problem, several conclusions suggest themselves. First, the training of kindergarten teachers may have elements which give these teachers more insights and security. Second, parents may be more accepting of their children's performance in kindergarten and, third, kindergarten teachers report appreciably *more* conferences than other groups of teachers. Furthermore, first grade teachers and teachers of ungraded classes also indicate less difficulty and also have more conferences than most other groups. Is the repeated conference experience itself perhaps the significant factor? *Do these teachers indeed learn by doing?*

FURTHER RESEARCH

The findings of the study suggest that:

1. It would be useful to survey teacher training institutions to determine the course content which is focused on helping the student teacher gain skills and insights in the dynamics of relationship.

2. Pilot programs of interdisciplinary seeding of theoretical concepts could well be undertaken in universities which offer training for teachers, social workers, psychiatrists, and anthropologists. Evaluation of such programs, including provision for follow-up of teachers for several years after their assignment to schools, should be most helpful to schools of education in planning curricula.

3. School systems could plan a variety of approaches to in-service training for parent-teacher conferences and evaluate them over a period of years to determine which is most effective.

4. It would be enlightening to address a similar study to parents.

ORGANIZATION AND FUNCTIONS OF THE CENTRAL STAFF OF THE OFFICE OF THE SUPERINTENDENT IN SUBURBAN SCHOOL DISTRICTS WITH POPULATIONS OF 10,000 TO 100,000

by JOHN MORRISON KING*

PURPOSES OF THE STUDY

The purposes of the study were to discover (1) the organization, functions, and size of central administrative staffs; (2) any relationships existing between the staff organization and the size of the school district population; and (3) any relationships between staff organization and the instructional cost per pupil.

PROCEDURES

The first step was to review and interpret the literature related to the organization, size, and functions of the central staff of the office of the superintendent of schools. The literature was analyzed according to (1) studies related to administrative staff size, organization, and functions; (2) the line-and-staff concept in relation to administrative organization; (3) responsibilities of the superintendent in relation to staff organization and functions; (4) the business manager and the administrative assistant in relation to staff organization; (5) grade organizational patterns in relation to staff organization; and (6) size, functions, and organization of the central administrative staff as related to district populations and to annual pupil costs.

The second step was the formulation of a status questionnaire and the completion of a survey to ascertain the organization, size, and functions of the central administrative staff of the office of the superintendent of 262 suburban school systems within the 10,000 to 100,000 district population range. The questionnaire yielded data concerning the following background factors of the school systems involved in the study: (1) title of the school district political unit, (2) school district area, (3) school district population, (4) average daily attendance in school systems, (5) elementary and secondary grade organization, (6) annual per pupil cost, (7) annual cost for central office administration, (8) annual rate of growth of average daily attendance, (9) number of teachers in the system, (10) annual rate of teacher turnover, (11) status of the superintendent, (12) housing arrangement for the central office staff, and (13) policies for the selection of administrative staff members. The questionnaire also yielded data concerning the administrative organization and functions of the central office in relation to the staff positions of assistant superintendent,

* A.B. 1929, Central State College, Oklahoma; A.M. 1935, University of Oklahoma; Ed.D. conferred June 6, 1962. Professor in charge of research: James Harold Fox, *Professor of Education*.

director, administrative assistant, business manager, and elementary and secondary general supervisors.

The third step was to analyze the data in terms of relationships between administrative staff organization and (1) the size of school district populations and (2) the annual instructional cost per pupil. The methods used in the analysis of the data were, for the most part, the computation of averages and percentages.

FINDINGS

1. The superintendent is directly responsible for the program of instruction and the department of personnel in the majority of the school systems: he delegates responsibility more frequently in the larger systems and in the systems where pupil costs are higher.

2. The superintendent is directly responsible for public relations in the large majority of the school systems; he delegates the responsibility more frequently in the larger systems. Higher pupil costs do not appear to be a significant factor in the delegation of responsibility for public relations.

3. The superintendent is directly responsible for research in all but sixteen of the larger systems. Pupil costs do not appear to be a significant factor in the delegation of this responsibility.

4. In four-fifths of the systems all administrators, including the business manager, are directly responsible to the superintendent. In some of the smaller systems, and in some systems where the annual per pupil costs are less than $400.00, the business manager reports directly to the board of education.

5. The superintendent delegates the responsibility for business affairs in all of the larger systems and in the systems that spend more than $500.00 annually per pupil.

6. Lack of balance was discovered in the assignment of administrative functions. Some staff members appear to be overloaded in comparison with other staff members.

7. Those in the position of assistant superintendent are often delegated the responsibility for the program of instruction, the department of personnel, and the management of business affairs.

8. More frequently in the larger than in the smaller systems the responsibility for business affairs, the program of instruction, and the department of personnel are delegated to one or more assistant superintendents.

9. An assistant superintendent is responsible for the program of instruction and business affairs more frequently in systems that spend more than $500.00 annually for each pupil. There appears to be no relationship between his responsibility for personnel matters and per pupil costs.

10. There are relatively few systems in which an assistant superintendent is in charge of public relations or research. The systems in which he is delegated this responsibility are the larger ones and those that spend more than $500.00 annually per pupil.

11. A relationship was not discovered between numbers of directors and assistant superintendents in systems and district populations or per pupil costs. Many smaller

systems have as many directors and assistant superintendents as larger systems, and per pupil costs do not appear to be a significant factor.

12. Responsibility for public relations and instruction is often delegated to one who holds the position of director.

13. The responsibilities for public relations and instruction are delegated to directors more frequently in larger than in smaller systems. Directors are in charge of public relations more often in systems that spend more than $500.00 each year per pupil than in systems that spend less. There appears to be no relationship between the number of directors in charge of instruction and pupil costs.

14. Less than one-half of the systems have administrative assistants; though there appears to be no relationship between numbers of administrative assistants in systems and school district populations. They are more frequently found in systems that spend more than $500.00 annually per pupil.

15. In very few of the systems, and in only the smaller ones, are administrative assistants responsible for personnel, business affairs or public relations. There are no systems in which they are delegated the responsibility for the program of instruction.

16. No significant relationship was discovered between the frequency with which administrative assistants are delegated responsibility for personnel and business affairs and the amount spent annually per pupil.

17. The business manager, who is directly responsible to the superintendent in four-fifths of the systems, is one of the principal members of the staff to whom the superintendent delegates the responsibility for business affairs. He is more frequently in charge of business affairs in the larger systems and in systems that spend more than $500.00 annually for each pupil.

18. The majority of the systems have general elementary supervisors assigned to the central staff. They are found more frequently in larger systems and in systems that spend more than $500.00 each year per pupil.

19. One-third of the systems have general secondary supervisors assigned to the central staff. They are found more frequently in larger systems and in systems that spend more than $500.00 each year per pupil.

20. A supervisor in charge of the program of instruction is found in very few systems. None are in charge of instruction in the larger systems, and the systems in which a supervisor is in charge spend less than $500.00 annually per pupil.

21. There are very few systems in which a supervisor is in charge of the department of personnel. None are in charge in the larger systems, and there appears to be no relationship between the number of supervisors in charge of personnel and annual per pupil costs.

RECOMMENDATIONS

Analysis of the data in this study warrants the following recommendations.

1. Job descriptions should be established for all members of the central administrative staff. Although local conditions and available personnel may impose limitations on the selection of administrators, clearly defined areas of operation would eliminate overlapping of authority and duplication of performance of functions.

2. There should be a better understanding and interpretation of the nomen-

clature of titles of administrative positions on the central staff. For example, the role of an assistant superintendent should be more clearly distinguished from the role of an assistant to the superintendent.

3. An analysis of staff-directed functions and building-controlled functions might establish a clearer understanding of the spheres of operation between staff and building administrators.

4. Research is needed to analyze other factors that might lead to the implementation of more uniform and functional practices in central office administrative staffing in suburban school systems. Some suggested areas of study are: (a) the financial ability of school systems in relation to pupil costs and administrative staffing, (b) comparisons between suburban and urban administrative staff organization to discover conditions related to understaffing, and (c) to find relationships between administrative staffing problems in suburban school systems within the population range of this study and a higher population range of suburban systems.

THE NUMBER, INTENSITY, AND PERSISTENCE OF PROFESSIONAL PROBLEMS OF BEGINNING ELEMENTARY SCHOOL TEACHERS AS RELATED TO PATTERNS OF TEACHER PREPARATION

by LUTHER FRANKLIN SIES*

THE PROBLEM

Studies concerned with the problems experienced by elementary school teachers have focused primarily on identifying problems. Few have attempted to determine the possible relationships of professional preparation to actual difficulties experienced in the classroom. Until more is known about these relationships elementary teachers will not be adequately prepared to meet the complex demands made by contemporary American society. This study sought to provide some data regarding these relationships.

This was a study of the number (frequency), intensity, and persistence of professional problems experienced by three groups of beginning female elementary

*A.B. 1948, Ed.M. 1954, Western Maryland College; B.S. in Ed. 1950, Maryland State Teachers College, Towson; Ed.D. conferred June 6, 1962. Professor in charge of research: Anthony Charles LaBue, *Professor of Education*.

school teachers with varied patterns of professional preparation. More specifically the study had two major purposes:

1. To identify the professional problems of three groups of beginning female elementary school teachers.

a. A group of elementary school teachers who graduated from a liberal arts institution with a Bachelor of Arts degree and who had neither completed more than 12 hours of professional education course work, nor performed student teaching. This group was designated as the No Teacher Preparation group.

b. A second group of elementary teachers who have graduated from a school of education, teachers college, or liberal arts college with a Bachelor's degree representing a major in secondary education. This group was designated as the Secondary Teacher Preparation group.

c. A third group of elementary school teachers who graduated from a school of education or teachers college with a Bachelor's degree representing a major in elementary education. This group was designated as the Elementary Teacher Preparation group.

2. To determine the differences in the number (frequency), intensity, and persistence of the professional problems experienced by beginning elementary school teachers with the above patterns of professional preparation.

PROCEDURE

A preliminary and comprehensive review of the literature pertinent to the professional problems reported by both experienced and beginning teachers preceded the organizational phase of this study. This review specifically focused upon the literature relating to various problems experienced by beginning elementary school teachers.

The sample for this study was made up of 119 female elementary school teachers from two county school systems in the greater Washington area. All teachers had completed either their first or second year of teaching.

Two types of data were needed from each teacher in the sample. One type of data was concerned with information related to educational preparation and teaching experience. These data were obtained by means of a background information questionnaire.

The other type of data needed was concerned with the number (frequency), intensity, and persistence of professional problems in carrying out selected professional activities. For securing these data, a self-rating scale was devised. Seventy-one professional activities were included in this scale. Each teacher was asked to rate each professional activity in terms of (1) the difficulty in working with it; (2) its intensity as a professional problem; and (3) its persistence as a professional problem.

The analysis of background information questionnaires permitted the researcher to:

1. Identify preparation factors and experience factors
2. Classify the subjects into three criterion groups

The analysis of the data obtained from the Rating Scale resulted in:

1. Computing mean ratings for each criterion group on each scale (frequency, intensity, and persistence)

2. Testing the significance of the difference between mean ratings among criterion groups for each scale

3. Computing percentages for each specific professional activity representing identification by subjects of the criterion groups as frequent, intense, and persistent professional problems

4. Testing the significance of the differences between percentages among criterion groups for specified professional activities on each scale

SUMMARY OF THE FINDINGS

With respect to the mean ratings for the criterion groups based on the analysis of rating scale responses of frequency, intensity, and persistence, the study showed that:

1. The Elementary Teacher Preparation subjects had fewer professional problems than did the No Teacher Preparation subjects.

2. The Elementary Teacher Preparation subjects had fewer persistent professional problems than did the No Teacher Preparation subjects.

Statistical analysis of the differences between percentages among the criterion groups apparently indicates that significant differences exist. This analysis of the differences between percentages was performed for the factors of frequency (number), intensity, and persistence of professional problems.

With respect to the frequency (number) of professional problems, the study showed that:

1. The Elementary Teacher Preparation group experienced significantly less difficulty with thirty-eight professional activities than did the No Teacher Preparation group.

2. The Elementary Teacher Preparation group experienced significantly less difficulty with nine professional activities than did the Secondary Teacher Preparation group.

3. The Secondary Teacher Preparation group experienced significantly less difficulty with thirteen professional activities than did the No Teacher Preparation group with respect to frequency as a problem.

With respect to the intensity of professional problems, the study shows that:

1. The Elementary Teacher Preparation group experienced significantly less difficulty with eight professional activities than did the No Teacher Preparation group.

2. The Elementary Teacher Preparation group experienced significantly less difficulty with two professional activities than did the Secondary Teacher Preparation group.

3. The Secondary Teacher Preparation group experienced significantly less difficulty with three professional activities than did the No Teacher Preparation group.

With respect to persistence of problems, this study showed that:

1. The Elementary Teacher Preparation group experienced significantly less

difficulty with thirteen professional activities than did the No Teacher Preparation group.

2. The Elementary Teacher Preparation group experienced significantly less difficulty with two professional problems than did the Secondary Teacher Preparation group.

3. The Secondary Teacher Preparation group experienced significantly less difficulty with three professional activities than did the No Teacher Preparation group.

CONCLUSIONS

This investigation seems to support the following generalizations and conclusions:

1. Teachers who had completed an elementary education sequence had fewer and less persistent problems than liberal arts graduates who had not completed a professional sequence of any kind.

2. When specific professional activities are analyzed it appears that teachers who have completed an Elementary Education sequence are better able to recognize and utilize principles underlying the dynamics of learning and individual growth and development than teachers who completed no professional education sequence of any type. The teachers who performed student teaching and completed the course work of the professional education sequence apparently were better able to recognize in advance the requirements of the teaching profession and some of the problems it presents, and to understand the administrative duties and extracurricular participation it entails. A realistic view of teaching, then, in combination with some recognition of, and experience with its problems may account for the differences found between these two groups.

3. Teachers who had completed a professional elementary education sequence experienced significantly fewer problems than did those teachers who completed a professional secondary education sequence and accepted a teaching position in the elementary school.

4. Teachers who had completed an elementary education sequence experienced fewer difficulties with activities related to providing for individual differences which are found among children in the elementary classroom; providing an atmosphere for optimal learning; and the motivating of pupils than did teachers who had completed a secondary education sequence. They also experienced less difficulty using the community as a laboratory for learning experiences. Practice Teaching and course work in the secondary education sequence most likely did not provide the teachers with the experiences and skills needed to teach elementary children.

5. There were no significant differences between the teachers who had completed a professional secondary education sequence and those teachers who had not completed a professional education sequence of any type with respect to the mean number of professional problems experienced in terms of frequency, intensity, and persistence. Teachers who had completed a secondary education sequence experienced less difficulty with activities concerned chiefly with the planning and conducting of group work, the learning process, and co-operating with specialists in remedial programs. The requirements of the teaching profession and its administrative duties

also were activities for which the teachers trained for the secondary school experienced significantly fewer problems than did those who had completed no professional education sequence. Each of these problem areas most likely was related to a lack of knowledge and understanding of the professional aspects of teaching. Although their course work and professional laboratory experiences were not planned primarily to prepare them for teaching in the elementary school it is apparent that the Secondary Teacher Preparation teachers profited from their professional education sequence.

6. Fewer significant differences were found between the Elementary Teacher Preparation and the Secondary Teacher Preparation teachers, than between the Elementary Teacher Preparation and the No Teacher Preparation teachers. When present these differences would appear to be those which specifically concern the duties of the elementary school teacher as contrasted with those of a secondary school teacher. These differences apparently are an outgrowth of the specialized Secondary Education sequence which they had completed. The differences between these two groups with respect to the intensity and persistence of problems appear to indicate that their professional education sequence enabled them to identify and solve professional problems as they arose.

7. Although many professional problems were identified the number identified as intense and persistent were relatively smaller. Student teaching provides learning opportunities to which teachers respond. It seems, however, to provide more opportunity for teachers who have already received professional training. This points up the importance of professional laboratory experiences.

FURTHER RESEARCH

As one analyzes the findings in this study, certain needs for further research and study in the following areas seem apparent:

1. A study of professional problems to determine the possible differences among problems identified by teachers who have experienced varied patterns of student teaching, such as duration of student teaching, part-time or full-time, etc.

2. A follow-up study of teachers who began teaching without professional preparation to determine the effect of classroom experience and in-service training upon the number (frequency), intensity, and persistence of professional problems they experience.

3. A longitudinal study of graduates who have completed an Elementary Teacher Preparation sequence to trace changes in the frequency, intensity, and persistence of professional problems.

4. A study of the number (frequency), intensity, and persistence of professional problems reported by elementary teachers who have had at least ten years' teaching experience. What do they believe was instrumental in helping them solve the professional problems they encountered?

5. A comparative study of the number (frequency), intensity, and persistence of professional problems experienced by beginning male and female elementary school teachers who have completed a professional Elementary Education sequence.

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1959

THE LAW SCHOOL, 1865

THE GRADUATE SCHOOL OF PUBLIC LAW, 1959

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF AIR SCIENCE, 1951

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898